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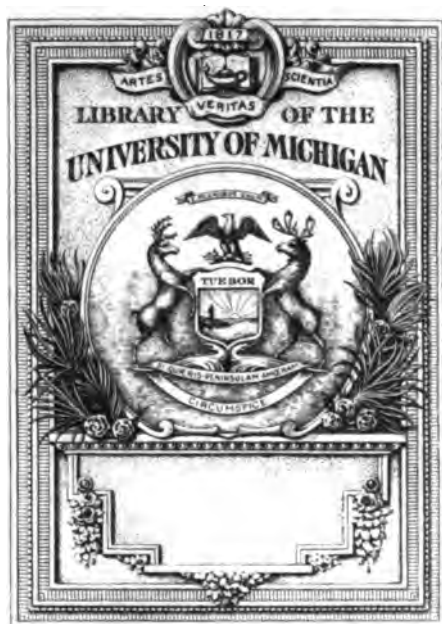
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DOCUMENTS
OF THE
SENATE

OF THE
STATE OF NEW YORK.

ONE HUNDRED AND THIRTY-THIRD SESSION.

1910.

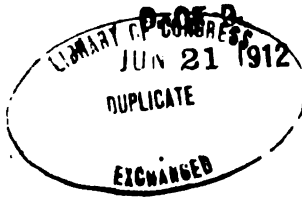
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1910

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THIRTIETH ANNUAL REPORT

OF THE

State Department of Health

OF

NEW YORK

FOR THE YEAR ENDING DECEMBER 31, 1909

VOLUME I

ALBANY
J. B. LYON COMPANY, PRINTERS
1910

STATE OF NEW YORK

No. 27.

IN SENATE

FEBRUARY 21, 1910.

THIRTIETH ANNUAL REPORT

OF THE

STATE DEPARTMENT OF HEALTH

STATE OF NEW YORK,

EXECUTIVE CHAMBER,

ALBANY, *February 21, 1910.*

To the Legislature:

I have the honor to transmit herewith the thirtieth annual report of the State Commissioner of Health for the year 1909.

CHARLES E. HUGHES.

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NEW YORK STATE DEPARTMENT OF HEALTH

Division of Administration

Commissioner

EUGENE H. PORTER, M.D.

Secretary and Deputy Commissioner

ALEC H. SEYMOUR

Division of Sanitary Engineering

Chief Engineer.....THEODORE HORTON, C.E.
Principal Assistant Engineer.....H. B. CLEVELAND, C.E.
Special Assistant Engineer.....Prof. H. N. OGDEN, C.E.
Assistant Sanitary Engineer.....C. A. HOLMQUIST, C.E.
Assistant Engineer.....C. F. BREITZKE, C.E.

Division of State Laboratories

Director.....WILLIAM S. MAGILL, M.D.
Chief Sanitary Chemist.....L. M. WACHTER
Bender Laboratory — Director.....THOMAS ORDWAY
Bacteriologist.....W. G. FELLOWS
Bacteriologist.....WILLIAM H. BING, M.D.
Cancer Laboratory — Director.....H. R. GAYLORD, M.D.

Division of Vital Statistics

Director.....F. D. BEAGLE

Division of Communicable Diseases

Director.....WILLIAM A. HOWE, M.D.

Division of Publicity and Education

Director.....HILLS COLE, M.D.

Tuberculosis Exhibition — Director...CHARLES W. FETHEROLF

Consulting Staff

Dermatologist.....FREDERIC C. CURTIS, M.D.

Ophthalmologist.....HERBERT D. SCHENCK, M.D.

Orthopedist.....HARLAN P. COLE, M.D.

Laryngologist.....JOHN B. GARRISON, M.D.

Statistician.....Prof. WALTER F. WILLCOX, Ph.D.

Tuberculosis Advisory Board

EDWARD R. BALDWIN, M.D.....Saranac Lake

THOMAS DARLINGTON, M.D.....New York city

LIVINGSTON FARRAND, M.D.....New York city

Hon. HOMER FOLKS, Esq.....New York city

GEORGE W. GOLER, M.D.....Rochester

WILLIS G. MACDONALD, M.D.....Albany

ALFRED MEYER, M.D.....New York city

Prof. VERANUS A. MOORE, M.D.....Ithaca

JOHN H. PRYOR, M.D.....Buffalo

WILLIAM H. WATSON, M.D.....Utica

JOHN L. HEFFRON, M.D.....Syracuse

REPORT

TO HON. CHARLES EVANS HUGHES, *Governor of the State of New York, Albany, N. Y.:*

SIR:— I have the honor to transmit herewith the thirtieth annual report of the State Department of Health for the year 1909:

THE WIDER VIEW

The advance in sanitation is an index of the progress of modern civilization. The development and application of sanitary law is the result of an increasing altruistic knowledge.

Behind every movement for civic improvement, back of every effort for social or economic betterment, may always be found the moral impulse that stirs to action. Sanitation, with all its wealth of scientific achievement, with all its earnest and able workers, would never have made such rapid advance without the aid of an aroused and partially emancipated public sentiment. When many men thinking independently come to the same conclusion, action is likely to follow, and when men so thinking demand facts and carefully weigh the evidence there is likely to be action along right lines. Education is the dynamite of our civilization. It has broken some of the follies of superstition and ignorance and will break many more.

So education in sanitary science had not progressed very far before it was perceived that a great door had been opened for general betterment. Not merely stamping out of epidemics, the disposal of sewage or investigation of water supplies, important and urgently necessary as these are, but that wider field that embraces all that makes toward the absolute prevention of all misery and disease came clearly into view.

And so there came into being that great and increasing number of societies and organizations devoted entirely to changing the old order of things, working always for clean cities, clean homes, clean air, and also, therefore, for clean morals.

These societies that look after proper playgrounds, sufficient parks, decent tenements, pure food, clean streets, efficient factory supervision, protection of child labor, care of working women, pure water, tuberculosis, and many other things, are all playing a most important part in the great struggle of the new against the old — of knowledge against ignorance. Deprived of the aid and strength of these auxiliaries sanitary science would have halted and stumbled much more than it has. These societies are almost always composed of laymen and not of trained sanitarians. This is most significant for it shows how rapidly education in sanitation is progressing.

If it is true that at times the enthusiasm of some of these lay workers remains untempered by judgment and that they seem to prefer occasionally to work against rather than with the health officials and so miss the greatest possible effectiveness, yet that should count but little against the immense amount of good work they are doing. Their appearance and continuance is one of the most significant signs of the times.

But after all if we are to have this real sanitation, the sanitation of a wider view, we must widen the vision of the people. For the great problems before us in sanitary science must be solved by experts. The question then is not what will our laws do for us or our legislatures do for us or our courts do for us. The question is what will our schools do for us? It comes to that in the last analysis. For if we are to reach our final goal we must have a greater efficiency, a greater sense of justice, a greater self-sacrifice that must come from a high type of citizenship. So the duties and responsibilities of a health department are not only changed but they are very greatly increased and constantly changing.

To cause the citizen to do the things he can and ought to do, and then do for him the things he can not do, but should be done is the duty of the State.

OUR POLLUTED WATERS

Professor Sedgwick, in his very admirable address at the Annual Conference of Health Officers of New York State last November at Rochester, said that among other things the nine-

teenth century discovered, it discovered dirt. Up to that time dirt had not been discovered. We have learned to look about us for the causes of many of the worst evils that afflict us. For malaria we look not to swamps but mosquitoes; for diphtheria not to drains but our neighbors, for consumption to infection, and for typhoid fever to infected water or milk.

It is doubtless true that the United States has more typhoid fever than any other civilized country. The total number of cases in the entire country is probably between 300,000 and 400,000. In the State of New York in 1909 there were 1,309 deaths very largely due to polluted and infected water supplies. The conditions existing in this State are most deplorable. There is a limit to the amount of pollution which any stream of known size and character can with impunity receive, and the results of investigations made by this Department covering a number of years form an impressive and grave testimonial to the fact that many if not most of our larger streams have reached this limit and most have passed it.

That such a condition of affairs exists is a public disgrace. For it is a condition that we wilfully and knowingly allow to continue. We know that typhoid is mainly a water-borne disease; that many of our public water supplies are dangerously polluted; that we can properly care for and dispose of our filth — and yet so far it has been impossible to obtain adequate legislation. The law of 1903 provided that the plans for all sewers *to be* constructed must be submitted to the Commissioner of Health for approval. This law is entirely inadequate since municipalities discharging sewage into the waters of the State prior to May 7, 1903, could not in any way be affected by the requirements of the Department unless they desired to immediately extend their sewer systems.

Under the imperfect and limited provisions of this law very little relief from the intolerable existing condition could be obtained. So obnoxious are the prevailing conditions that a strong public sentiment has been aroused in favor of speedy and adequate legislation. It would seem that with a full knowledge of the necessity of action the Legislature would not now hesitate to pass a properly drawn measure giving authority to begin the purification of our waters.

The bill which the Department proposes to introduce at this session of the Legislature has been prepared after a careful study of the situation in this State and the laws in force in other States, and it is believed affords a simple and effective means of solving this question while perfectly protecting the interests of all parties.

The bill enables the Commissioner of Health *with* the approval of the Governor and Attorney-General, to require the sewage of a city or village to be treated in some manner when a public nuisance is caused or the health of citizens of the State is endangered by its free discharge. The effect of this act would be gradual and in the line of public progress. There is absolutely no longer any need or excuse for a municipality to discharge its raw sewage into any stream where a menace to health or a nuisance is created. Plans for sewage disposal can now be readily designed and constructed to meet all the requirements of satisfactory sewage disposal under practically all local conditions that are likely to be met with in practice.

Industrial wastes are included in the bill and under its provisions may be removed from streams as rapidly as conditions will permit. It is always a considerably more expensive and difficult matter to correct and remove pollution when it has once occurred, than it is to prevent it before that point is reached.

It is proposed under this bill, if enacted into law, to bring about a clearer understanding and induce a real co-operation between all interests involved, which after all is fundamental to all real and practical progress.

SUMMER RESORTS

The experience of the Department during the past few years has clearly demonstrated that there is a considerable need for reform in the manner and customs of living at many of our summer resorts, scattered through the mountainous districts of the Adirondacks and Catskills and along the shores of Long Island. These resorts have become the mecca for not only a large number of tourists but a growing class of urban population having homes principally in our larger cities, who during the summer months seek health and recreation at these quiet and restful places. It was, therefore, shocking to discover that at

many of these resorts, where health is the prime object, the sanitary conditions were almost deplorable.

A campaign against insanitary conditions and practices at these resorts was begun by the Department some three years ago, when, during the summer months, systematic inspections were made of the conditions of water supply, sewage disposal, plumbing and other features; following which appropriate action was taken requiring changes or improvements where insanitary conditions were found to exist. This work was continued during the succeeding two years, has been extended in scope to include other summer resort sections of the State, and, in general, has been recognized as an important part of the work of the Department and has been placed on a systematic and somewhat permanent basis.

The conditions revealed by these inspections showed forcibly that the daily customs of living at many of these remote and unsuspected resorts were not only primitive and insanitary, but that in some cases they seriously menaced the health and life of a considerable number of persons or patrons who undoubtedly were ignorant or unsuspecting of any danger. As a result of these systematic inspections and the conditions revealed by them, and the beneficial effects which have followed the subsequent action of the Department toward the improvement of these conditions, it is my purpose to continue this vigorous campaign until these insanitary resorts or plague spots, where thousands of unsuspecting health and recreation seekers visit annually, are either removed or placed in a proper sanitary condition.

PROTECTION OF PUBLIC WATER SUPPLIES

It is a difficult thing to make any deep or lasting impression upon the individual possessed with full and vigorous health, of the importance of the conservation of vital forces or of the necessity of taking anything more than ordinary precautions in the protection of this blessing. This same apathy which applies in the case of the individual applies also with reference to a community, which has not suffered any epidemics of disease or in which the general public health may be considered good.

Laws may be passed which are considered reasonable, or perhaps even stringent, concerning the duties of municipalities or the

boards and water companies having control of water supplies, but unless there is something back of these laws to induce or stimulate the carrying out of these duties adequate and efficient protection of our public water supplies can hardly be expected. As experience is accumulated in this field of our Public Health work the correctness of this principle becomes more firmly established and the necessity for taking more aggressive, and in some cases even drastic, measures to combat this public apathy becomes more apparent.

The question is, therefore, ever before us as to how this can best be done. While educational work through the medium of the State Department of Health is and will always remain a strong motive force in inducing our communities and water boards to protect or remove any pollution of their public supplies, there must be coupled with it suitable official action by the Department which will stimulate this protective work by these local boards or will compel these boards to act in such cases as occasionally arise, as, for instance, on Peekskill, Clayton and Niagara Falls, where the pollution of their water supply and the resulting danger has been clearly and strongly brought before them.

The efforts and progress of the Department along these lines has been referred to in former reports to you, especially in my last year's report, when attention was called to a special order to all municipalities and water companies controlling water supplies in the State calling for a special inspection and report of the sanitary condition of the watersheds with respect to contaminating sources furnishing these supplies. The work which devolved upon the Department as a result of this special order extended into the past year, and a summary of the work and the beneficial results accomplished will be referred to later.

The Department's work does not stop here, however, for such orders and action refer only to water supplies, which are protected by the special rules and regulations enacted by the Department, and it is evident that much, and possibly even more, work and action must be taken to conserve those supplies not subject to these special rules and regulations and where consequently less measures and means are available for their protection. The Department began in 1908 a special investigation

of water supplies in the State not protected by rules and regulations, having in view the double object of educating these municipalities and their municipal representatives as to sanitary principles controlling the purity of their supplies, and furnishing such information and data as would induce and enable them to make any desirable improvements of the supply.

This campaign for the better improvement of these two classes of water supplies has already proven of great good. In fact, it is practicable to estimate how much good, but, in view of the large number of sources of pollution that have been removed from the many protected supplies, and the willingness and promptness with which the recommendations of the Department have in many cases been carried out following the investigations and reports of water supplies not controlled by rules and regulations, it is believed that this good accomplished has been very great; and it is in my opinion quite necessary that the work of conserving the water supplies along these two lines be continued and if possible extended during the coming year.

EDUCATION

It has already been noted that the advance of modern sanitation depends in very great measure upon the efficiency and extent of our educational agencies. The men of to-morrow are the children of to-day. It is to them we must look for the knowledge and earnestness required for the continued progress of this work. Realizing fully the vast importance of this educational work, the Department has made every effort to extend and increase its value. An idea of what has been done may be gained by a glance at the following four subdivisions.

(a) Public Schools:

One of the most important steps forward in sanitary education, the greatest very possibly, ever taken in this State is the announcement of the Department of Education that hereafter regular and systematic instruction in sanitary science and public health will be given to the first eight grades in all our public schools.

The beginning of this teaching will mark an epoch in the history of sanitation and the resulting benefits will be of inestimable value to the State.

Three years ago, with the permission of the Department of Education, this Department had begun a systematic examination in the 490 incorporated high schools of the eyes, ears, nose and throat of the children. While at first there was slight opposition from a few school principals, it quickly disappeared when the real value of the examination was understood. It is the expectation of the Department that in time each school under its local government will conduct these examinations. Some are already doing so. It was found also that from these examinations and the resulting benefits grew a desire for more instruction in sanitary matters.

(b) Colleges and Universities:

From our public schools to our colleges and universities is but a step. Every college in this State should establish without delay a real live course in sanitary science and state medicine. There is no longer any excuse for delay. Such instruction is being demanded by increasing numbers of students and the demand should be heeded. For from our colleges, medical schools, technical schools, must come the trained and expert sanitarians. These will be the leaders in the years to come.

It is gratifying to be able to announce that the second year's course in sanitation at Cornell University has been again a marked success. The number of those regularly taking the course has more than doubled and the largest lecture hall is overcrowded at each lecture. The course consists of about sixty lectures on the most important sanitary topics delivered by the most eminent experts and sanitarians in this country. All these men have given their service and ability for two years without reward save that of serving the cause. This experimental school at Cornell has demonstrated that such schools are now needed, that students eagerly avail themselves of the advantages offered, and that very practical and satisfactory results are attained.

In the light of this experience at Cornell it is clear that it is the plain duty of every advanced educational institution in the State to establish without delay a practical obligatory course in sanitary science and state medicine. The time is rapidly coming when degrees of Doctor of Public Health will be granted and

all health officers will have to produce some evidence of training in health matters.

The Department desires to see a course in sanitation in every college in the State and its services if needed are at the disposal of any or all.

(c) **Schools for Health Officers and Experts:**

For several years the Department has held sanitary institutes for the instruction of its medical experts and health officers. At the present time these special educational activities have been somewhat increased and during the year there will be fifteen short courses of about a week's duration with lectures, demonstrations and practical laboratory work for health officers.

The several branch laboratories of the Department will also give instruction to students. There will also be held several meetings for conference and instruction of the medical experts of the Department.

In addition by the kindness of Dr. A. H. Doty, health officer of the Port of New York, the great opportunities afforded by the Quarantine Station at Staten Island are made available to health officers in the State. There instruction will be given in sanitary matters, particularly inspection, diagnosis, disinfection and quarantine.

(d) **Literature:**

It must suffice to say that during the past year over a million circulars and pamphlets and 150,000 copies of the Bulletin have been distributed.

TUBERCULOSIS

Popular educational work for the prevention of tuberculosis has been continued along the very successful lines detailed in former reports. The plan of co-operation between this Department and the State Charities Aid Association in conducting municipal campaigns for the prevention of tuberculosis has been conducive of a maximum of results.

The itinerary for the Department's large traveling tuberculosis exhibition for the season 1909-1910 is as follows: Syracuse, Corning, Olean, Jamestown, Dunkirk, Niagara Falls, Lockport, Amsterdam and Watervliet. The first six cities had been visited at the time of writing this report and with the single exception

of Dunkirk, where the weather conditions were most unfavorable, a notable attendance was secured.

The various communities have been quick to realize the great practical value of the exhibition and attendant campaign of education and very effective local co-operation has been forthcoming. To this work must be attributed the accelerated response in this State, to the demand for hospital and sanatorium accommodations for sufferers from tuberculosis and the more or less widespread institution of local measures of a preventative nature, such as visiting nurses, dispensaries, bacteriological laboratories and the organization of volunteer associations to combat tuberculosis.

Hearings on Tuberculosis Hospitals:

Under Chapter 171 of the Laws of 1909, amending Section 319 of the Public Health Law, which requires the person, association, corporation or municipality proposing to establish a hospital, camp or other establishment for the treatment of tuberculosis, to file a petition with the State Commissioner of Health describing the character of the institution, its location and site, and appointing the State Commissioner of Health and the local health officer who constitute a commission to approve or disapprove the establishment of such hospital, camp or other establishment, a number of hearings have been held.

In the matter of the application of the Brooklyn Central Labor Union for permission to establish a hospital in the town of Brookhaven a hearing was held at Patchogue June 11, and the application was granted although considerable opposition was offered by the residents of the town.

The Albany Subdivision of the National Red Cross Association filed an application for permission to establish a tuberculosis hospital in the town of Guilderland, Albany county, and hearing was held July 7th. No opposition was presented and the application was granted.

The board of supervisors of Ontario county filed an application for permission to establish a tuberculosis hospital in the town of East Bloomfield and a hearing was held at Canandaigua July 28th, and the application was granted.

The Workmen's Circle of New York City filed an application for permission to establish a tuberculosis hospital in the town of

Liberty, Sullivan county, and hearing was held on August 24th. Application was acted on favorably by the State Commissioner of Health, but the local health officer refused permission. Under the provisions of the law, the application was then referred to Hon. Horace White, Lieutenant-Governor of the State, and Hon. James W. Wadsworth, Jr., Speaker of the Assembly. The desired permission was granted by them.

The city of Poughkeepsie was granted permission to establish a hospital in the town of Poughkeepsie and two hearings were held in Rochester on application for permission to establish tuberculosis hospitals by the county of Monroe in the town of Perinton, and the town of Brighton, Monroe county, and both these applications were acted upon favorably.

A hearing was held Devenber 23d on the application of the Laurent Manor Company, for permission to establish a hospital in the town of Mt. Pleasant, Westchester county.

I desire to call attention to the fact that this law limits the State Commissioner of Health to a period of ten days — “not less than thirty days nor more than forty days” — after the petition is received by him, during which the hearing can be held. It would seem that a wider latitude might be given under the law so that in cases where there is no opposition they could be disposed of with less delay and the period of time during which the hearing may be held and decision may be rendered might be somewhat lengthened. As the law stands at present, it is sometimes exceedingly difficult to comply with its provisions, and in cases where there is strenuous opposition every opportunity should be afforded for a full and complete investigation.

For the Future:

It will be seen that the educational work of the Department is resolving itself into definite results. We need more hospital provision for tuberculosis cases and this is rapidly being supplied by provision for county hospitals and other institutions.

This work should be encouraged as much as possible and county hospitals should be constructed on model lines. The educational work should be continued and a strong effort should be made on the part of health authorities in our municipalities to see that

the provisions of the Tuberculosis Law are fully complied with. We must have a more complete registration of cases and the preventative measures must be more fully carried out.

Several of the great life insurance companies have undertaken educational work in tuberculosis among their policy-holders, by means of their great army of agents. This work is to be highly commended and can be made a great factor in spreading popular education in sanitation. The suggestion made that typhoid fever and its causes be taken up by insurance companies is also a most valuable one, for with their great force of experts an immense advance could be made.

COMMUNICABLE DISEASES

Special attention has been given during the year to communicable and contagious diseases occurring in the State. Every serious outbreak of contagious disease has been carefully followed and where necessary thoroughly investigated. When needed the resources of the Department have been promptly placed at the disposal of afflicted communities.

Within the last few months the list of medical experts has been thoroughly revised and the State tentatively divided into a certain number of districts, each under the supervision of one or more of the medical experts. The thanks of the Department and the State as well, are due these gentlemen who serve as experts, as the remuneration is in no way commensurate with the services they render. The munificent sum of \$300 a year is the most each may receive. If the Division of Communicable Diseases is to reach its highest point of efficiency there must be provided for, at least, ten district sanitary supervisors, each being held responsible for his own particular district. No money could be spent to better advantage than by providing for adequate supervision of the State by this division.

The Control of Rabies:

The commendable efforts of another Department in careful supervision and regulation of dogs throughout the State, as the principal course of the propagation of rabies, have not succeeded in eradicating this disease in animals nor diminishing in any marked degree the danger of its transmission to human beings.

The cases of rabies in man are on the increase throughout this country and consequent measures for the special treatment requisite for the saving of life in such cases have become imperative. The recent investigations of this Department indicate that about 1,000 citizens of this State require this specific treatment of rabies yearly.

Provision has been made by law permitting county officials to secure relief for individuals bitten in their communities by rabid dogs, but the only available methods of cure are exceedingly expensive and so illy adapted to prompt succor as to be quite inadequate to meet such insistent demand.

Investigations and developments in the therapy of rabies have progressed so far in recent years that the Department is now in a position to provide a suitable therapeutic substance for treatment of all cases occurring within the State that may require the Department's aid.

The study and preparation of this subject, outlined in the report of the preceding year, has been completed. The initial steps of practical preparation have been undertaken at the State Hygienic Laboratory, and the Department is ready to begin this year the distribution of matter for the prophylactic treatment of rabies to any practicing physician requiring this material.

This entire work has been undertaken and carried to its present point by the Department, without funds or assistance of any kind.

It has been a matter of such urgency as to require this extra work and effort from our staff. But, the entailed expenses of outfit, package and distribution throughout the State, must be met. The already strained resources of the Laboratory Division, on account of the limited appropriations available, do not permit the undertaking of such expenses, unless further resources may be provided for them.

CANCER LABORATORY

The pleasing developments of the vital statistics of the past year, and their showing of decrease of the general mortality of this State, brings, by contrast, more decidedly into notice and insistent consideration, the fact — long cited in preceding reports — that diseases of cancerous nature are markedly and increasingly refractory to the conquering march of sanitary progress and a consequent demand of diminished mortality.

Deaths from Cancer are Increasing:

Where death yields to good hygiene all along the line of markedly infectious diseases, where the mortality of typhoid, diphtheria, and similar diseases of the oft-dreaded epidemical type shows a frequent yearly decrease, and in some cases last year their minimum death rate, cancer as a cause of death is increasing.

The persistent increase of a death factor, in spite of all the efforts and progress of modern science, characterizes cancer as one of the most threatening scourges of the human race.

What the State long ago undertook and has supported with a few thousands of dollars has served as a model for private philanthropy in many instances.

It is a mark of development of the State's initiative when its pioneer work stimulates the citizens to do their part. What better token is needed of the value of such initiative in the Cancer Laboratory's establishment, than the fact that the few years that have elapsed since its beginning have witnessed the donation of millions of dollars of private wealth for the express purpose of carrying out more rapidly, thoroughly and extensively the necessary research work that shall determine the cause and provide for the control of cancer?

When the day of this victory comes it will be to the credit of our State that she was foremost in the initiative of this great human achievement.

DEPARTMENT DIVISIONS**DIVISION OF SANITARY ENGINEERING**

The work which the Division of Sanitary Engineering is called upon to perform comprises not only the solution of many fundamental and practical problems and the performance of specific duties required by law which present themselves daily in the routine of State health work, but also the investigation and solution of many larger problems which must of necessity arise in a State which covers so large a territory and has so many and varied industrial interests and social complexities as the State of New York.

This important division of the State Department of Health has been in existence for only a few years, but during this brief interval the scope of its usefulness and the many duties which devolve upon it have so increased that during the past year it has

been difficult to meet the numerous demands made upon it. This condition, of course, while it reflects much credit upon the growing intelligence of our people and an awakened public interest and desire for better sanitation throughout the State, also reflects a responsibility and duty which the State owes its people in return, in keeping pace with this progressive tendency and furnishing the means and facilities by which these demands may be adequately met. This movement toward better sanitary condition can only be encouraged, and this duty can only be fulfilled under our present form of State government in two ways: First, by equipping this important branch of the State Department of Health with the necessary engineering staff and facilities to enable it to furnish assistance and advice when called upon; and, secondly, by furnishing the necessary *additional* equipment and facilities, when, as now seems imperative, the limit of its resources has been reached.

An outline of the more important work of the Engineering Division for 1909 will now be given and, in doing this, I will refer to the various subdivisions of the work under the same headings used in my last annual report.

Protection of Public Water Supplies:

Although the Public Health Law provides for a partial control over the public water supplies of the State through the enactment and enforcement of suitable rules and regulations formulated by the State Commissioner of Health when application is made by the local board or water company having control over these supplies, the Department would manifestly be performing only partially its proper functions in this important field if it limited its operations to the performance of these duties alone. It may be considered almost an axiom that the good health of any community is in a large measure directly proportional to the purity of its public water supply, and, as a corollary, that one of the first and prime duties of a municipal government, and especially of a State department, is to see that these public supplies are secured from pure and unpolluted sources and that these sources are maintained in an unpolluted and safe condition.

It is evident, then, that notwithstanding the lack of full control over these public water supplies provided by the Public Health Law and the difficulties oftentimes met by lack of proper authority, the State Department of Health through its Engineering Division must be called upon to perform many active duties, engage in many

investigations and render much advice and many reports concerning present and proposed water supplies throughout the State. The activities of the Engineering Division in this particular field of work may be classified under the three following headings:

(a) Investigation and protection of public water supplies subject to rules and regulations enacted by the State Commissioner of Health.

(b) Investigation and protection of public water supplies not protected by rules and regulations.

(c) Investigation of water purification plants.

The work performed by the Engineering Division during the past year under each of these headings will now be taken up and briefly described.

(a) Protection of Water Supplies Controlled by Rules and Regulations:

During the past year applications were received for the enactment or amendment of rules and regulations for the protection of public water supplies in the following four cases:

New York State Training School for Boys at Mohansic Lake.
Monticello.

Haverstraw Water Supply Company.
Syracuse Suburban Water Company.

These rules and regulations were enacted or amended in the cases of the proposed New York State Training School for Boys at Mohansic Lake in Westchester county and the village of Monticello, but in the cases of the Haverstraw Water Supply Company and the Syracuse Suburban Water Company the rules have only been prepared and are awaiting further advices from these companies and from the local health authorities before their enactment. It is significant to note the comparatively few supplies for which applications for enactment of rules and regulations were received, and it is possible that among the reasons accounting for it may be the better understanding among local officials, due to recent experiences and court decisions, that these rules and regulations do not provide protection unless adequate compensation is made for any damages sustained by their enforcement; and a slight reluctance on the part of local authorities and water companies to assume the financial responsibilities entailed by the strict enforcement of these rules.

It was essential, and in some cases it was found necessary, to point out clearly the real responsibility attached to the enactment and enforcement of these rules and regulations in order to avoid on the one hand any misunderstanding on the part of the boards and companies making the application, and on the other hand any false feeling of security among the water consumers concerning the safety of the supply furnished by such rules. If, then, in view of this better understanding as to the operation of such rules and regulations, there still remains any hesitancy among those interested in applying for these means for protecting the purity of their water supplies, I can see no adequate remedy under the present Health Law; for, even with more stringent measures and greater power lodged with the State Commissioner of Health, it would be impracticable, in face of public sentiment and lack of facilities in this Department, to patrol and search out all possible sources of danger upon these many watersheds now protected, or for the Department to assume to perform the functions and duties required of the local authorities in the enforcement of these rules.

It is evident, then, that no real advance can be made in this direction without considerable educational work and until the local communities have been made to realize the dangers that underlie their apathy, and have become impressed with the fact that this question is one of self preservation. With this end in view it was found desirable to make a number of special investigations of certain water supplies which are protected by water rules following which full reports were prepared and transmitted to the local authorities containing the results of these investigations and the conclusions and recommendations concerning the measures which should be taken to better protect these supplies and calling attention to the danger points on the watersheds which could and should be removed under the existing rules and regulations of this Department. A list of the municipalities where the water supplies were thus investigated and reported upon during 1909 is as follows:

Amsterdam,
Newburgh,

Canastota,
Port Jervis,

Saugerties.

Attention was called in my report to you of last year to a general order issued in 1908 to some forty-seven municipalities of the State whose water supplies are protected by rules and regulations, calling for a thorough examination of the watersheds furnishing

the source of these supplies and a report of all violations of these rules which were found to exist, and a list of the municipalities to which such rules were issued was then given. The results of this action were very satisfactory for, although it entailed considerable work on the Engineering Division in verifying the violations reported as a result of the many inspections of the local authorities, it revealed a very large number of violations, many of which were potentially, if not actively, dangerous, and enabled the Engineering Division to incidentally determine the extent and character of polluting sources upon the various watersheds and to classify these supplies with respect to their sanitary quality and general purity.

Only five out of these forty-seven water boards or companies, viz., Cobleskill, Kingston, Mechanicville, Rome and Walton, failed to furnish the necessary information required by these orders; and although subsequent notices have been sent them, they have so far failed to properly or fully comply with the original order and for this reason these cases will be made the subject of further investigation and action.

With some sixty-seven water supplies in the State under the protection of rules and regulations enacted by the Department it is expected that, with the natural growth of rural population on these many watersheds, there will continually arise cases of pollution which will call for action of the local water boards or water companies in their removal and in many of these cases it will be necessary for the local water boards or companies to refer them in turn to the State Department of Health before they can be successfully removed. The inspection of the violations and the issuance of necessary orders to local boards of health for their removal form an important part of the work of the Engineering Division in relation to this class of public water supplies, and during 1909 violations in the following cases were reported and examined into by the Engineering Division and the necessary orders issued to local boards of health:

Auburn,	New York,	Saratoga Springs,
Hudson,	Peekskill,	Yonkers.

(b) Protection of Water Supplies not Controlled by Rules and Regulations:

By far the larger number of water supplies in the State are not protected by rules and regulations enacted by the State Department of Health. Many of them are underground supplies or

supplies taken from watersheds remotely situated and uninhabited and the water from which is free from pollution and generally safe. Many of these supplies, however, are not so favorably situated and are subject to some pollution and are consequently of questionable quality. How best to improve the quality of these supplies in the absence of water rules has always been one of the problems before the Department.

It was considered that as a prerequisite to any material progress toward the improvement of these supplies it would be necessary to make an investigation of the sanitary conditions of the sources from which these supplies are derived. Accordingly, in 1908, a special investigation was undertaken by the Engineering Division of a selected number of 225 surface water supplies in the State not protected by rules and regulations, and having for its object, first the securing of information concerning the physical features of each supply and the sanitary condition of the watershed from which it was derived, and secondly, the preparation of a report based upon the knowledge thus secured setting forth the findings and conclusions concerning the sanitary quality of the water furnished and recommendations concerning any changes or improvements which it would be desirable or necessary to carry out.

The practical results of this manner of investigating and reporting upon many of the supplies of the State which have not received the proper attention which they should have received, were shown by experience to be so satisfactory during 1908 that this work was continued during the year 1909. In my report to you of last year there was presented the list of municipalities the water supplies of which it was possible to investigate and report upon during 1908. During the past year it was possible to investigate and report upon some twenty-five more of the original list of municipalities as follows:

Amsterdam.
Berlin,
Cairo,
Camden,
Canandaigua,
Castile,
Cazenovia,
Deansboro,

Deposit,
Florida,
Haverstraw, W. Haverstraw
and Stony Point,
Margaretville,
Port Jervis,
Sag Harbor,
Saugerties,

Sidney,
 Sidney Center,
 South Glens Falls,
 Suffern,
 Walden,

Washingtonville,
 Waterloo,
 West Carthage,
 White Plains,
 Williamsville.

In addition to the investigations described above, relating to water supplies not protected by rules and aside from the routine and special work of the division in connection with water supplies protected by rules, examinations have been made or advice given to other municipalities in response to special requests for aid in solving specific problems relating to public water supplies.

The need for these investigations and for a consideration of the questions at issue has been brought about in some cases by the necessity of seeking a new source of water supply or by the desirability of improving the condition of the intake, or the distribution system or of some other undesirable feature of the water supply; and in other cases has arisen from some unusual prevalence of typhoid fever or other intestinal disease or from the existence of conditions that threatened the sanitary quality of the water. All such special requests are followed by an investigation, if the conditions require a field examination, and the report of the investigation or a letter of advice in the matter is transmitted to the local authorities.

Such investigations have been made and reported upon during 1909 by the Engineering Division for the following forty-eight places:

Albion,	Frankfort,	Mt. Vernon,
Bardonia,	Fulton,	Newark,
Binghamton State	Geneva,	Newburgh,
Hospital,	Granville,	New Rochelle,
Canastota,	Green Island,	New York,
Canton,	Hamden,	Niagara Falls,
Cape Vincent,	Hammondsport,	Ogdensburg,
Catskill,	Highland Falls,	Olean,
Central Valley,	Hudson,	Oxford (Women's Re-
Comstock (Great	Lyons,	lief Corps Home),
Meadow Prison),	Machias	Peekskill,
Corning,	Marlborough,	Pine Hill,
East Syracuse,	Monroe,	Pleasantville,

Poughkeepsie,	Staatsburg,	Watervliet.
Prattsville,	Suffern,	Waverly,
Rensselaer,	Tarrytown,	Wellsville,
Saratoga Springs,	Tupper Lake,	White Plains.

(c) Investigation of Water Purification Plants:

This special investigation was begun in 1908 and the nature of the work and the results accomplished during that year were fully outlined in my report to you covering that year. A full description of each plant inspected and the results obtained generally by the methods of operation employed were presented in the twenty-ninth annual report of the Department.

The knowledge gained by this investigation in 1908 showed so clearly that many of the so-called filter plants in the State, especially some of those in the smaller villages, were so crude in design and showed such apparently low efficiencies that they could hardly be classified as purification plants. This work is important, however, as forming suitable records of the Department and as a basis for attempting improvements in construction and operation when this contemplated phase of the work in connection with them is taken up; and for this reason the work has been continued during 1909.

A list of the municipalities where the filter plants have been investigated during the past year is as follows:

Ardley,	Mamaroneck,	Port Chester,
Arctic,	Middletown,	Rensselaerville,
Central Valley,	Mt. Vernon,	Suffern,
Cobleskill,	North Pelham,	Tarrytown,
East Worcester,	North Tarrytown,	Warwick,
Jeffersonville,	Oneonta,	Yonkers.
Larchmont,	Pleasantville,	

Investigation of Outbreaks of Typhoid Fever:

Although it is true that in many places in this State conditions exist which must give rise to an undue prevalence of typhoid fever and other water-borne diseases, it is also fortunately true that outbreaks or epidemics of this disease are not of frequent occurrence. When we consider that these outbreaks are always preventable and therefore unnecessary, and that these epidemics are attended with human and financial loss that approach in some

instances almost a calamity, further emphasis is unnecessary to point out the grave and important duty of the Department in dealing promptly with them.

Whenever a case of epidemic of this disease is reported to this Department, it is at once investigated. Experience has shown that typhoid fever is very frequently associated in its cause with the water and milk supply or with some factor associated with general sanitary conditions in the community, and that in a search for the true source of trouble there is frequently necessary an intimate knowledge of engineering principles concerning water supply, sewerage or stream flow. For these reasons the work of investigating these outbreaks has devolved very properly upon the Engineering Division, and in every case a careful investigation is made to determine the source of infection and to recommend immediate action which should be taken to remove the cause and suppress any further spread of the disease.

During 1909 the Division was called upon to investigate and make reports in four cases of outbreaks or undue prevalence of typhoid fever in the following municipalities:

Camden,	Cooperstown,
Clayton,	Richmondville.

Sewerage and Sewage Disposal:

The Public Health and Village Laws provide generally that all plans for systems of sewerage and sewage disposal shall be submitted to, and approved by, the State Commissioner of Health before they may be constructed or put into operation. The law further provides that no sewage, factory wastes or other refuse shall be discharged into the waters of the State unless express permission be granted by the State Commissioner of Health. Under these two provisions of the law, then, the Engineering Division is called upon to perform the more important and larger part of its routine duties. These duties comprise the detailed examination and report on plans for all original systems of sewerage or extensions and reconstruction thereof; and the preparation of permits containing the conditions under which the discharge of sewage, sewage effluent and factory wastes into the waters of the State may be permitted.

During the past year plans for systems of sewerage and sewage disposal were examined and permits prepared in connection with the following municipalities:

Allegany,	Ithaca,	Perry,
Auburn,	Lake Placid,	Phoenix,
Batavia,	Lancaster,	Pleasantville,
Bath,	Malone,	Port Chester,
Bedford,	Medina,	Poughkeepsie,
Binghamton,	Monticello,	Rochester (State
Brown's Station,	Mt. Vernon,	Hospital),
Corning,	Newark (State Cus-	Rome (State Cus-
Depew,	todial Asylum),	todial Asylum),
Dolgeville,	New Rochelle,	Sharon Springs,
East Rochester,	North Pelham,	Silver Bay (Lake
East Syracuse,	Ogdensburg,	George),
Elmira,	Olean,	Somers Center,
Fort Edward,	Oneonta,	Tarrytown,
Fulton,	Ossining,	Tonawanda,
Fultonville,	Oswego,	Wampsville,
Gates (Town),	Pelham (sewage dis-	Watertown,
Haverstraw,	posal plant for	Yonkers.
Hudson (State	town),	
Training School),		

The list of the places where permits were issued during the past year for the discharge of sewage from individual properties or of wastes from industrial establishments into the waters of the State under restricted conditions, is as follows:

Caughdenoy,	Gowanda,	Oran,
Chadwicks,	North Bangor,	River Forks (Town
Chautauqua Lake	Ogdensburg,	of Brookfield).
(20 individual cases), Olean,		

As might be expected, there is in addition to the applications received for the examination of plans and the issuance of permits, many requests for special investigations or advice concerning sewerage systems now in use or about to be installed and these cases frequently entail visits or the preparation of reports.

A list of the places where such investigations and reports have been prepared during the past year is as follows:

Alfred,	Hempstead,	Pyrites,
Dannemora,	Hermon,	Sonyea (Craig Colony
Deposit,	Herring,	for Epileptics),
Fort Edward,	Lowville,	Ticonderoga,
Fultonville,	Point O'Woods,	Waterville.
Hamburg,		

Investigation of Stream Pollution:

The subject of stream pollution is one the importance of which cannot be overstated or too often stated. Whether it arises in connection with our upland streams and the farms adjoining them or with our mountain lakes the shores of which are dotted with summer camps and cottages, or with our larger rivers with their adjacent municipalities and industrial establishments, the need for reform continues, indeed must continue until an enlightened sense of sanitary duty, if not decency, prevails, and these once pure waters are returned to something approaching their original purity.

It is needless to say that the efforts of the Engineering Division devoted to this arduous and oftentimes hopeless task constitutes one of the most important duties entrusted to it or imposed upon it by the Public Health Law. Much has been accomplished, it is true, during the short time this Engineering Division has been in existence, and especially in view of the limited funds and resources with which it has been provided; but much more must be accomplished in the future if real progress is to be made in the protection of our water supplies and suppression of insanitary conditions which have until recently been allowed to continue more or less unchecked.

The work of the Engineering Division in this field of practical and applied sanitation is so varied and complex in its nature that a subclassification of it is hardly possible. Nuisances caused by the discharge of sewage from municipalities and factories, overflow from cesspools and vaults and garbage dumped along the banks of streams are among the many cases complained of to the Department which call for inspections, investigations, reports and official action. Only the more important of these cases which have received the attention of the Department during the past

year will, however, be referred to in the following list which gives the names of the municipalities or townships in which the cases have arisen:

Akin	Cohoes	Middleport
Akron	Copenhagen	Mohawk
Albion	Corning	Mount Morris
Alden	Cortland	Napanoch
Bemus Point	East Meredith	New Kingston
Buffalo	Ellenville	North Bangor
Busti	Fishkill-on-Hudson	Ontario Center
Canaan	Geneva	Oyster Bay
Canisteo	Glen Cove	Phoenix Mills
Castile	Gowanda	Piermont
Chadwicks	Greenfield Center	Port Jefferson
Chappaqua	Jamestown	Rye
Charlton	Jefferson	Sloansville
Chazy	Jeffersonville,	South Lima
Cherry Valley	Johnstown	Stillwater
Childwold	Lackawanna	Thousand Island
Clarkson	Lake Huntington	Park
Clyde	Liberty	Utica
Cobleskill	Lockport	West Albany
Coeymans	Long Lake	York Center
Colonie	Manlius	

Public Nuisances Not Arising from Stream Pollution:

Although by far the larger number of nuisances which occur in the State are caused by the pollution of our streams, there are, however, a great many which have their origin in other conditions and surroundings. Many of these are of minor importance and should not be referred to the Department but should be handled by the local Board of Health, who have ample power under the Public Health Law to abate them. All complaints which are received are promptly acknowledged and properly referred to the local Health Officer for investigation if they are of lesser importance and fall properly within his jurisdiction; or are taken up and investigated by the Engineering Division and action taken upon them by the Department, if they are of such nature, magnitude or importance as to require the action of State authority.

Although a classification of these nuisances is impracticable, the ones which more particularly require the attention of the Engineer-

ing Division are in relation to improper disposal of garbage, insufficient drainage of swampy and low areas and insanitary conditions in communities arising from inadequate sewerage facilities. Allusion to only the more important of these cases will be made and the following list gives the municipalities where during the past year such investigations have been made:

Akin	Fulton	Patchogue
Akron	Griffin Corners	Peekskill
Amagansett	Haines Falls	Perry
Beaver River	Lockport	Plattsburg
Binghamton	Millbrook	Port Chester
Candor	Newtonville	Port Henry
Catskill	New Paltz	Schaghticoke
Clark's Mills	Newton Falls	Stockwell
Cold Spring	N. Tarrytown	Stuyvesant
Crown Point	Ogdensburg	Tannersville
Delhi	Old Forge	Waterloo
East Aurora	Oneonta	Wellsville
East Rochester	Ossining	Yonkers
Frankfort		

Investigations Ordered by the Governor:

Under the provisions of section 6 of article I of the Public Health Law an order was issued by the Governor calling for a further investigation of the nuisance created in Richmond county as a result of the operations of certain industrial establishments located on Constable Hook in the city of Bayonne, N. J.

A former investigation and report of the effect of the operations of these plants and the extent of the nuisance created in Richmond county and on the Kill von Kull was made during 1908, at which time the conclusion was reached that a nuisance was created by the operation of the plants which affected the health, comfort and property of residents in Richmond county and safety of vessels on the Kill von Kull. It was pointed out that owing to unfavorable seasonal conditions and the brief time available for the investigation, certain questions of fact were not as completely substantiated as was desirable and that conclusions were consequently based to a considerable degree upon more general information.

The supplementary investigation carried out under your recent order gave, therefore, not only additional time, but, owing to the

earlier and more favorable time of the year for the investigation, a better opportunity for a more complete inspection of the operation of these plants and of observing the effects of these operations in creating a nuisance in Richmond county and on the Kill von Kull. The findings and results of this supplementary investigation constitute a full confirmation of the conclusions reached as a result of the former investigation, and a full report covering the same will be transmitted later in my complete report covering the entire work of the Department for 1909.

Special Investigations:

The importance of making special investigations of certain conditions in addition to the routine work and duties of the division, specifically required under the Public Health Law, can not be overestimated when we stop to consider that the results of these investigations represent in a measure a working capital or foundation upon which much of the current work of the division is based, and that being largely of an educational nature, they are helpful in creating a better understanding among the people of the needs of certain sanitary reforms.

The special investigations carried on during the past year have been largely extensions of the same or similar investigations taken up in previous years. Two of these special investigations have been referred to under the protection of public water supplies, and descriptions of the remaining investigations will now be taken up under special headings of sanitary survey of watersheds, sanitary conditions of summer resorts, sanitary conditions of cities and illegal construction of sewers.

(1) Sanitary Survey of Watersheds:

Sanitary surveys of the watersheds of the more important rivers of the State have already been made and the full reports covering them have been published in the annual reports of the Department for the years 1907 and 1908. These surveys included such principal rivers as the Upper Hudson, Mohawk, Black, Raquette, Oswego, Allegheny, Susquehanna and Delaware, the total watershed areas of which cover the larger and more populous section of the State. For this reason and in order to complete other investigations now relatively more important, less attention was given during the past year in extending this investigation. In fact, only one additional watershed, the Oswegatchie river, was investi-

gated, and, although yet to be reported upon, this investigation will complete largely the northern section of the State which has been covered by these surveys.

The principal object sought by the sanitary surveys of these watersheds is the collection of full information of the location and character of the principal sources of sewage pollution of these streams. This information is made a permanent record and is valuable not only for ready reference in questions of stream pollution which continually arise in the routine of the engineering work, but enables the Department to form tentatively general policies with reference to its requirements for the disposal of sewage and wastes upon each individual watershed.

The information and records furnished by these sanitary surveys have been of such considerable value to the needs of the Department in dealing with the many problems relating to pollution of the streams of the State as to well justify the investigation and show the expediency of extending it, as time and opportunity permits, to the remaining watersheds of the State.

(2) Sanitary Conditions of Summer Resorts:

The investigation of summer resorts was first taken up by the Department in 1906, when in response to general notices sent out by the Department to proprietors of summer resorts and hotels information was obtained which revealed insanitary conditions of these resorts, and emphasized at once a pressing need of greater reforms in better protecting the health of this large and increasing population of the State which yearly seeks these resorts for recreation.

Accordingly, during the summer of 1907, an inspection was made of summer resorts along the shores of Long Island from the Nassau-Suffolk county line easterly along the south shore of Great South Bay to Patchogue, together with the sand spit known as Great South Beach, or popularly as Fire Island, as well as in the heart of the Catskill mountains. Of twenty-seven resorts inspected on Long Island five were found to be in an insanitary condition as to water supply, plumbing, or disposal of wastes, and letters were addressed to the proprietors requesting that changes be made to improve the sanitary surroundings of the resorts. Of sixty-four resorts inspected in the Catskills, insanitary conditions, in respect to water supply, plumbing or sewage disposal, were found at nine-

teen of these resorts, and letters were addressed to the proprietors at the close of the season, requesting that improvements be made.

During the summer of 1908 the investigation was resumed along two lines: First, the reinspection of those Long Island and Catskill resorts inspected during the season of 1907, where conditions were found to be insanitary, in order to determine whether these conditions had been corrected; second, the new inspection of resorts in that portion of the Adirondack region included in the Raquette River and Saranac River watersheds. Of the twenty-four summer resorts on Long Island and in Catskill mountains, whose owners had been asked to improve sanitary conditions found to exist in 1907, it was found that in fourteen cases insanitary conditions had been abated; in eight instances they had been partially abated; and in two cases conditions were found to exist as previously stated. In the Adirondacks forty-two resorts were inspected, sixteen being on the Raquette river watershed, and twenty-six on that of the Saranac river, and as a result letters were sent to the proprietors of twenty-four of these resorts requesting that insanitary conditions surrounding the water supply or affecting the general sanitary state of the resort be corrected, and in many instances calling their attention to the prohibition against the discharge of sewage into streams and lakes, specifying under what conditions as to sedimentation or preliminary treatment such discharge would be permitted.

During the past year, in order to systematize the work and to place the investigation on a firm basis, as well as to facilitate the work of inspection, the State has been divided arbitrarily into the following thirteen districts:

- 1 Thousand Islands — St. Lawrence District.
- 2 Fulton Chain — Big Moose District.
- 3 Raquette, Tupper and Long Lake District.
- 4 Saranac — St. Regis District.
- 5 Lake Champlain District.
- 6 Lake George District.
- 7 Lake Pleasant — Saratoga Springs District.
- 8 Western District.
- 9 Central — Finger Lakes District.
- 10 Otsego Lake — Richfield Springs District.
- 11 Catskill — Albany District.
- 12 Southern District.
- 13 Long Island District.

The work has been carried on along the same lines as in 1908, but on a larger scale. Whereas, in 1907 and 1908, it was possible to have inspectors on this work only a portion of the time, during the season of 1909 two inspectors have given their entire time to the work. One of these inspectors made a second reinspection of some ten delinquent resorts in the Catskills and Long Island where insanitary conditions were found to still exist on the reinspection made in 1908, and then proceeded to make new inspections of resorts in the Catskill-Albany District, the most congested of all the districts; the other reinspected the twenty-four resorts in the Adirondacks where insanitary conditions were found in 1908, and at the same time carried on new inspections in that region. In addition to these two inspectors a third gave a portion of his time to the inspection of resorts in the Central-Finger Lakes District.

As a result of the summer's investigation the work of original inspection has been completed in four of the districts listed above, viz., Nos. 2, 3, 4 and 9. In District No. 11, 191 new inspections have been made, and work has been started in District No. 12, where some twelve inspections were made.

The posting of notices containing sections of the Public Health Law prohibiting the pollution of the waters of the State, as noted in my last annual report, was also continued within the inspection work of the past season. Effort was made to post these notices in prominent places along Adirondack lakes and streams and in the Catskills. The endeavor to thus inform property owners of the prohibition against stream pollution and to emphasize the policy of the Department of prohibiting as far as possible the further pollution of the waters of the State has met with the approbation of the majority of the summer resort proprietors.

(3) Sanitary Investigation of Cities and Villages:

The sanitary investigations of cities and villages in the State has been continued along the lines outlined in my last two annual reports. In each case studies have been made of the topographical, geological, industrial and sociological peculiarities of the locality; of streets and pavements; of water, milk and ice supplies; of the disposal of sewage and garbage; and an analysis of mortality statistics. These investigations have been of great value, for, based upon the findings and conclusions reached in each case, definite and valuable recommendations have been made to the local authorities.

In 1907 and 1908 investigations were made and completed of the following nine cities and villages:

Babylon,	Dunkirk,	Niagara Falls,
Cohoes,	Elmira,	Ogdensburg,
Corning,	Newburgh,	Poughkeepsie.

During 1909 reports were completed for three municipalities inspected in the latter part of 1908 and for six inspected during the past year, as listed below, the first three in the list being those investigated in 1908:

Mt. Vernon,	Auburn,	Hornell,
Port Chester,	Binghamton,	Ithaca,
Port Jervis,	Geneva,	Oswego.

It has been my custom to transmit these reports to the local authorities, and it is worthy of comment that in nearly all cases immediate steps have been taken to carry out the recommendations and advice contained in these reports. It is thus evident that these investigations have been productive of great practical benefit and have amply justified the time and labor spent in their preparation.

(4) Illegal Construction of Sewers:

Violations of the Public Health Law with respect to the discharge of sewage into the waters of the State without a permit, as required by Sections 76 and 77 of Article V, and the failure of some municipalities to properly submit plans for sewerage and sewage disposal, are matters that have given me considerable concern and careful thought during the past year.

The importance of the evils arising from these violations, the difficulty of satisfactorily investigating and securing evidence proving their existence; the somewhat questionable limit of authority of the State Commissioner of Health in certain cases which have arisen and the consequent desirability or expediency of some revision or modification of the Public Health Law in this regard, have all been pointed out and discussed in my previous reports to you for 1907 and 1908. Until the past year it has been the hope that these omissions to comply with the State laws were largely the result of oversight or indifference on the part of municipal authorities and that by properly calling attention to them they would be properly corrected. While this opinion proved to be true in many cases and a prompt compliance with the law

was effected, there were found to be many cases where not only reluctance, but actually defiance, of these laws were shown.

This matter is in my judgment now one of paramount issue and with this conviction I have had prepared and have submitted to the Attorney-General a list of the cities of the State which have violated the provisions of the Public Health Law in the above mentioned regard and which have after due notice failed to correct or rectify the same. In referring these cases to the Attorney-General, his opinion was asked as to the specific scope of authority of the State Commissioner of Health under Article V with reference to sewerage and sewage discharge, and as to his powers and duties in enforcing these sections of the law and collecting the penalties stipulated therein.

This matter was not referred to the Attorney-General until late in the year, and his opinion has not as yet been received. As soon as this opinion has been rendered, however, it is hoped that the way will be clearly pointed out whereby these cities can be properly and effectively brought into line and the dangerous conditions of stream pollution which now result from many of these violations effectively removed.

LABORATORY DIVISION

The work of the Laboratory Division for 1909 has been one of marked expansion, progress and efficiency. To report upon that work it is well to group the services of this Division as follows:

A. Educational.

B. Routine investigations for purposes of sanitary control of potable waters and foods.

C. Diagnostic examinations for the detection of infectious disease and control of quarantine.

D. Special investigations of epidemic complaints or unsatisfactory sanitary matters in various communities and institutions of this State.

E. Preparation and distribution of bacterial products, sera and therapeutic material.

Group A:

The educational work of the Division of Laboratories has been of marked development. There are now available at Albany fifteen short courses, practically of one week's duration each, with a full program of lecture, demonstration and laboratory exercises for the training of health officers, for the more efficient service

of the public of the State. For these courses an ample and thoroughly trained teaching staff and laboratory facilities are provided by this Department.

In addition thereto, an auxiliary laboratory is established at Ithaca, New York, and in hearty co-operation with the authorities of Cornell University, that laboratory is able to offer demonstrations of the methods of sanitary examinations of potable waters to all health officers or members of boards of health for whom that locality is available and who are interested in seeing personally the methods employed in laboratory investigation of that nature.

This Ithaca laboratory is also an available center for courses of instruction under the direction of this Department and is so used.

The courses offered at Ithaca are utilized by the young students of Cornell University who aim to engage in a career of public health work.

The generous co-operation of the health officer of the port of New York has rendered also available instruction and training in sanitary matters, particularly of inspection, disinfection and quarantine, for which his station is so justly famous.

The utilization of opportunities available at Quarantine Station at Staten Island is open to health officers recommended for such training by the Commissioner of Health.

In addition to the short technical courses mentioned above as available at Albany and Ithaca, and the special training available at the port of New York, the central administration has organized and is offering special courses at the laboratory in Albany, devised and concentrated on the particular purpose of training medical experts for service in the State Department.

For the utilization of such courses, the medical experts already appointed for such service in the State are assembled at stated periods in Albany for the express purpose of utilizing these special courses to the utmost advantage; and the efficiency and standing of such medical expert is rated by the amount of such training and the definite use that he subsequently makes thereof in the service which he renders to this Department, and it is planned that in the future no person shall be considered eligible for medical expert service in this State who shall not have undertaken these special courses as a suitable preparation for the work which he desires to undertake.

As a matter largely of education, it is proper to say that the laboratory staff is utilized at every opportunity for the contribution of scientific papers at important medical meetings within the State, for addresses and papers of scientific nature at the Annual Sanitary Conference of Health Officers and at local conferences on health matters that are held from time to time in different portions of the State.

Furthermore, the Laboratory Division utilizes every edition of the Monthly Bulletin to report on the general work in hand and to expand in somewhat brief manner on any particular side of public health work occurring in its daily routine.

Group B:

The work of the Laboratory Division in this group consists very largely of the examinations of potable waters of the State, the control of filtration plants and the careful watch for and detection of sewage pollution.

During the year 1909, 1,702 analyses of water have been made, 1,056 of which were bacteriological examinations, and 646 chemical. Two hundred and forty-four public water supplies have been examined and of these 127 were examined once, 67 twice, 27 three times, 9 four times and 14 more than that number of times during the year.

Eighty-six bacteriological examinations of spring waters exploited in commerce in this State have been made, and also thirty-seven chemical examinations of such spring waters.

This amount of sanitary control of water supplies is very near the maximum amount that is possible for the present Laboratory equipment and staff in this line of work.

Relative to the great field for these investigations constituted by the potable waters of this State, it is felt that this amount of examination and control is totally inadequate. The public realization of the importance of pure water supply is already so great that it is imperative upon the Laboratory Division in this Department to expand this service of examination manifold, that it may not fall behind the well founded expectations and exactions of the increasingly intelligent public of this State, that is more and more insistently requiring the sanitary control of their potable waters and the protection of such public from the inexcusable dangers of water-borne disease.

The entire work of food examination and control undertaken by the Laboratory Division of the Department throughout the

year is too insignificant for mention, and a report from this Division that such a deficiency exists in a very important portion of its proper function is humiliating and it is no satisfaction to offer the only possible excuse, that there has been no provision of funds by the State for the undertaking of this work by the Department.

The growing public intelligence of all of the communities in this State is so great that public sentiment will not long permit such lack of control of food products handled in the State, investigations of which by the United States and other State governments are showing to be widely falsified and in far too many cases even dangerous to life.

Group C:

This year witnessed the accomplishment of a long cherished wish of the Department, in securing for the first time under one center, control of all of the Laboratory services of the Department, and in the latter part of 1909 the entire work of the heretofore existing pathological division has been concentrated with the other work of the State Hygienic Laboratory and is there carried out.

The reorganization of Laboratory methods, which this change of work has entailed, has been accomplished easily and without detriment to the daily promptitude and efficiency of this service and by this reorganization it is hoped to gain far greater promptitude and efficiency, and in addition a more exact report and control of infectious diseases occurring within this State.

Whenever a case of infection is diagnosed at the State Hygienic Laboratory, a report thereof is immediately made to the Division of Contagious Diseases, and the necessary measures of warning, assistance and control to prevent a spread of infection are undertaken by the Department; a great advantage on the former method, which was dependent upon the sometimes neglected duty of the health officer to report a contagious disease promptly to this Department.

Perhaps because of the greater efficiency and promptness of this service of diagnosis, though possibly because of the increasing knowledge of the medical profession throughout the State of the value of such services rendered by the laboratory, the amount of specimens received daily is increasing constantly and reference is made to the daily reports to show the enormous increase in amount

and consequent exactions of this work upon the capacity of the laboratory.

It is not uncommon to have from 25 to 40 specimens examined per day and it is happening with increasing frequency that a single institution is requiring diagnoses of 50 to 100 specimens in a single day.

The amount of this work has increased several hundred fold last year over that of the first years of its installation, and there is reason to believe that the present agitation throughout the State for exact information and control of tuberculosis pre-eminently, but of other infectious diseases also, will enormously increase the demand for this work of diagnosis by the State Hygienic Laboratory, the staff of which, available for this work, is now engaged to its full maximum.

Group D:

By reason of the limited staff of the laboratory division, the services of its members for special investigations have been spared as far as possible this year. The laboratory has always undertaken the technical and scientific work of any investigations made by this Department, irrespective of what division was charged with this work. In this connection the laboratory has made the examinations required by the engineering division in its investigation of vitiated air at Staten Island, the water supplies of a number of State institutions specially investigated by the engineering division, and various sites and proposed water supplies, also under the control of that division, and which are more properly reported there.

The laboratory has also supplied and undertaken all technical investigation and work of diagnosis for epidemics, investigated by the division of contagious diseases, which will be more properly reported under that division.

By members of its own staff, epidemics of diphtheria have been investigated and controlled at the Fairview Home, town of Colonie, a prolonged typhoid condition and epidemic at Clayton, and an epidemic of scarlet fever at Cornwall.

Group E:

Practically first in its establishment of all of the various laboratory services in this Department was the antitoxin laboratory, the services of which have continued with marked development each year.

Throughout the year 1909, 24,429 packages of diphtheria antitoxin of 1,500 units each, were prepared and distributed throughout this State. A statistical calculation based on the use of this antitoxin throughout all of the years during which it has been supplied by this Department indicates an average of 4,000 units of diphtheria antitoxin used for each person treated therewith for diphtheria. Calculated on this basis 9,160 persons have been treated by diphtheria antitoxin furnished by this laboratory during the year 1909.

The utility of this method of treatment is beyond all dispute, and knowledge of that fact has penetrated even the most remote corners of this state. The imperative necessity of the early use of diphtheria antitoxin is likewise penetrating widely through the State and the realization of this latter necessity is the important factor to reduce the present mortality of diphtheria cases treated by antitoxin.

A striking illustration of this fact is shown by our own statistics previously published, in which the mortality from diphtheria treated by our antitoxin based on a large number of cases and tabulated according to the number of doses following the appearance of disease, in which antitoxin is given, is as follows:

Mortality first day	3.4
Mortality second day	3.6
Mortality third day	13.0
Mortality fourth day	10.5
Mortality fifth day and later 25 per cent., making average mortality of	9.6

To remark that this general mortality is three times the mortality of cases treated on the first or second day, requires no further support of our contention that the reduction of the present general mortality of such cases to a very marked low point, is dependent merely upon the thorough realization of the necessity of using antitoxin immediately upon the first appearance of the disease.

During the last year the demands for antitoxin service increased with leaps and bounds, so that the average of the monthly distribution for the last of the year is more than the total amount of antitoxin issued for diphtheria by this Department in 1902.

More important than the mere increase in number of packages required in this service, is the fact that many of the institutions of this State have now realized the importance and efficiency of this method of treatment and are relying upon it to prevent disaster in a case of infection and by its use as immunizing agent to prevent the establishment of an epidemic in such an institution, or to control such epidemic if a foothold has been established. For this reason the Laboratory is subjected to unforeseen and pressing demands for enormous quantities of this antitoxin.

Within this month, while supplying two State institutions, one of them with a small quantity, another with relatively large quantity of antitoxin, a demand from the New York State Reformatory at Elmira, for antitoxin for the treatment of 1,000 persons, was received and supplied within 24 hours.

To maintain a service of such amounts and of such immediate and pressing demands, taxes the utmost powers of the staff. During the year a permanent night and day service of the Laboratory has been established and is maintained. Telegraphic and telephone communication is available night or day and holidays and an immediate shipment of a pressing demand is therefore possible, and is carried out, but the matter of delivery of supplies in such quantities has become a very serious problem.

The stable quarters are full and overflowing. There is no possible room for an additional horse, fourteen are in actual use, and with the increasing demand for antitoxin, more animals must be utilized and soon.

Furthermore, the entire quarters of the present Laboratory building are too cramped for satisfactory utilization by the present staff. There is not working room enough in the whole Laboratory for our present demands. There is not storage room enough for our actual requirements. Speaking generally, the entire buildings of the Laboratory are of a temporary nature, cheap wooden construction without cellar and rapidly deteriorating, and a consequent frequent repetition of necessity of varied repairs that are always expensive.

The part of the city in which the Laboratory and stables are located is building up very rapidly and the large stable, stable yard and accompanying disagreeable features are decidedly ob-

jected to by its neighbors and require a relatively heavy cost of up-keep and attention to prevent serious complaint on these matters.

The present situation is illy adapted and the present equipment inadequate for the work which we are actually doing. It is incapable of expansion and improvement at reasonable cost and there is in consequence the necessity of immediate and serious consideration of ways and means to meet the future requirements with adequate service on the part of the Laboratory Division.

During this year every possible effort, with the funds available, has been made to keep the present buildings and yard in proper condition of repair and cleanliness, but everything that is done there does not improve the fundamental lack of proper buildings and proper situation, nor does it provide for the important enlargement that is necessary for Laboratory quarters.

The production and supply of tetanus antitoxin seems to remain quite stationary, as it is based upon the demand in the State, and it is either due to the fact that tetanus is not prevalent, or that the realization of what an antitoxin serum can do for this disease is not sufficiently impressed upon the medical profession.

The resolution of the cause of this stationary point would be easily found by study of statistics and is of interest to determine.

In addition to the increased amount of antitoxins furnished, the service has been improved by the introduction of the syringe package and by an increase in the potency of the serum used, so that a larger number of units per cubic centimeter is handled in these syringes than has heretofore been issued.

During this year the Laboratory has adopted almost exclusively the use of concentrated and purified antitoxins, and the reports on the use of our antitoxins are indicating greater satisfaction of the profession, first, with the syringe form of distribution; second, with the increased potency; and third, the fact that the precipitated and purified product which we supply is markedly superior in avoiding the production of serum rashes and similar complications.

This year is the first during which the prophylactic treatment of ophthalmia neonatorum has been undertaken by this Department, and the preparation and distribution of the outfits for this

treatment are part of the work of the Laboratory Division. These outfits have been devised and prepared and a preliminary distribution of small quantities to every health officer and physician indorsing this method of treatment was made early in the fall.

About 20,000 of these outfits have thus far been distributed and they are supplied to every health officer upon his request therefor, and the co-operation of every health officer is invited to receive six outfits from the Department and see that they are distributed to the practicing physicians and mid-wives in his locality.

It is our endeavor to see that every professional person throughout this State, assisting at the birth of a child, is provided with these outfits and will use this remedy at that time.

The subject is a matter which requires some education and energy to bring to the notice of all the parties involved in its successful distribution in order to supply all the districts of the State, and for this reason the distribution can only be made progressively.

Its initial work is finished and its progress in widening stages of preliminary education and subsequent supply is now under way.

DIVISION OF COMMUNICABLE DISEASES

Investigation Work:

The investigation work of this Division has been considerable. There is frequent need for the special aid to localities because of doubt as to the diagnosis of an outbreak, especially in the case of eruptive diseases, so that expert advice has been necessary. The cause of epidemics, which, as with typhoid fever, must be discovered to control them, has had to be investigated; prolonged epidemics have had to be looked after and aid given to stop their progress; outside authority has had to be used to overcome public indifference or opposition; in public institutions for the care of children, epidemics, such as of diphtheria, have had to have specially scrupulous care. Impartial aid from outside a community often meets with acceptance from its people, which is sometimes lacking or rendered with indifference toward local health officers. By personal investigation where there was special need, and by daily communication with the local health officers, this Division of the Department has during the year kept a hold on the pre-

vailing communicable diseases in all parts of the State under the Department's jurisdiction.

The Department has also been kept in touch with the local health municipalities, and with the movements of communicable diseases, by the required report of health officers of certain of these diseases monthly, and of others such as smallpox, scarlet fever and diphtheria, immediately on their occurrence, along with specified data regarding the source, care, precautions and the like appropriate for each. A file is kept of these, and record, by means of which the central office of the Department is kept informed of health conditions reflected by these diseases and ready here and there to apply a remedy. By these records, investigations and correspondence, the Department has constantly at hand a memorandum of each municipality as to its transient or persistent affection with these preventable causes of sickness, and a gauge by which to measure and handle each case, and to maintain supervision of that part of the State which is under its supervision.

Smallpox:

At the beginning of the year epidemics of this disease were in existence at Amsterdam and at Middleburgh and surrounding towns in Schoharie county, a large number of cases in both localities. It was not controlled in Amsterdam until a smallpox hospital was established. In the spring there was a considerable outbreak of smallpox in Cortland and Homer; one was discovered at Bridgeport, Sullivan county, which infected other localities; also at Whitestown, near Utica, likewise spreading elsewhere. During the summer there was little prevalence. In the fall one sick with smallpox came to North Tonawanda from Canada, and there resulted an epidemic which still continues and has spread to Tonawanda and adjoining towns, not less than fifty-seven cases having followed this first case in all these places. This now abating outbreak has caused a good deal of effort and outlay to control by the local health officers and the State Department.

Smallpox occurred during the year in twenty-eight counties, the chief places of prevalence being in the places mentioned. There has been a record of 461 cases during the year, all but nine of which were outside of New York city. The number last year was

double this. In several instances outbreaks were initiated from a case imported from without, although for the most part the spread was from our own infected, often unrecognized as such, towns. The disease has been for the most part mild, and four deaths only have occurred from it. Much vaccination, our only recourse against it, has been effected. Opposition has in most places been inconsiderable.

Tuberculosis:

The work of controlling this most important of all preventable and communicable diseases has gone forward this year with the same earnestness as in 1908. The interest of the public has been secured in many localities; it has been stimulated by special tuberculosis congresses in which exhibits pointed out graphically the conditions on which the disease depends and the precautions to prevent its spread, with public meetings addressed by those from this Department and by local physicians and persons of influence have constituted the line of work. There has been as never before organized effort to control tuberculosis. The best people in many communities are combined to do away with insanitary dwellings, to instruct the ignorant and by frequent visitation to keep the affected from infecting the well; dispensaries are maintained and here and there tuberculosis hospitals are being established. It is a large proposition and its management enters far into the life of the people, but its conditions are all being taken up with a wise understanding and with increasing interest on the part of the people, and the eventual good result is certain.

Twenty-five years ago, when the population of the State was 6,000,000, there were 12,000 deaths from pulmonary tuberculosis yearly; ten years ago, to 7,000,000 population, there were 13,500 deaths yearly; now, in 8,500,000 population, there occur 14,000 deaths. While the actual mortality in the State for this period of years has shown a uniform and moderate increase yearly, rising from 12,000 to upwards of 14,000, the mortality relative to population has decreased, and it is most marked in these later years. Twenty-five years ago there were 200 deaths every year to 100,000 population; ten years ago it was but little less, 193 deaths for 100,000 population; this year it is 160. If the mortality rate of

the decade of the 80s prevailed now there would have been 17,000 deaths this year from pulmonary tuberculosis, instead of 13,948.

While this is not to be taken as a fair estimate of salvage in life, since the increment of population has been doubtless largely from outside and of healthy material, yet some of it may fairly be given to improved conditions. The uniformity of the yearly mortality, the little varying toll paid month by month to this large cause of prolonged invalidism and death, is the notable fact, and the need to combat it is just as urgent as ever. The average yearly reported mortality for twenty-five years is 13,200, and the variations from the average have always been inconsiderable.

The number of cases reported to the Department this year was 32,937, which is a ratio of 2.4 living to one death. This is a very substantial increase in reported cases over last year; it shows better, more complete, reporting of living cases. This is a gain toward control. There are certainly, however, many yet not on record. This securing of returns is one of the distinct accomplishments of the year. It is comparatively new, having been only of recent years undertaken and by laws of 1908 required. Difficulties surround the securing of the report of tuberculosis which do not apply to other communicable diseases. Having it, it is possible to reach each with instructions to sick and well, and sometimes with the means of cure.

Typhoid Fever:

There was no large epidemic of typhoid fever during the year. Of outbreaks there were some and of persistence in localities for years having an excess of typhoid fever there were some. At Cape Vincent on the St. Lawrence river, and taking its water supply therefrom, a rather abrupt outbreak occurred in March; there were sixteen cases in a population of 1,200, with three deaths. At Clayton, further down the river, this disease became excessive in March. The water of this river, which is of immense volume and by laboratory test pure, is unfit to drink raw, as has been repeatedly found true, as the sewage, though greatly diluted, carries much of the time typhoid bacilli under conditions favoring their prolonged vitality.

At East Kingston, Ulster county, fifty cases occurred in a settlement of laborers; a number of workmen in a marble quarry at

Wingdale, Dutchess county, were affected with typhoid fever, some of whom found their way to hospitals in New York; at Coopers-town there was a considerable outbreak; Newburgh had much typhoid fever in the fall. Of other places, where there was special prevalence, were Auburn, Lockport, Walden, Camden, Richmondville, Coeymans, Hector. In the absence of a serious epidemic the mortality was lower than in 1908, 1,300 deaths in the twelve months, December to December. This is a low rate of fourteen per 100,000 population. The urban rate was thirteen, the rural fifteen. The average number of deaths yearly from typhoid fever for twenty-years has been 1,600. The reported cases for the year were 7,971, six cases to one death.

Every case of typhoid fever is made a subject of inquiry and investigation, or should be. The causes are not always clear, but no disease is more needless, especially in communities having a controllable water supply. In recent time numbers of conspicuously typhoid fever towns have been delivered from this chronic infection by purifying the water supplied to them. There are still some where the public sentiment has not yet arrived at the corrective point.

Diphtheria:

In New York city 16,186 cases of diphtheria were reported, and 4,500 in the rest of the State in the twelve months to December of this year, which, as also the mortality, is a little smaller than in 1908. In the metropolis there were thirty-eight deaths per 100,000 population, in rural towns less than ten. The ratio of deaths to reported cases in the city of New York was as one to ten; in the rest of the State, with undoubtedly less perfect returns, the lethality was much greater. The entire urban mortality from diphtheria was thirty-two per 100,000 population, the mortality of smaller cities being less than twenty. All of which shows that diphtheria is a disease of large cities. There was no noteworthy epidemic of diphtheria prevalent during the year and the mortality is almost the lowest on record. The decreasing number of deaths is mostly due to the extending larger use of antitoxin, its early employment for the sick, and the use of it to immunize the well.

One of the difficulties health officers have to contend with in the management of diphtheria, and one liable to escape their attention, is the occurrence of so-called germ cases; those in which, in possibly exceedingly mild cases that are overlooked from lack of clinical symptoms, or where in persons who have been attendants upon the sick but in no way affected themselves, the bacilli of diphtheria exist in the throat; these may continue to exist there for an indefinite length of time, and as long as they do, render the subject infectious. On these antitoxin has no effect, its potency being only in the control of the disease. The prolonged isolation that seems necessary for such individuals is one of the hardships of diphtheria.

Scarlet Fever:

There was a continuance of the prevalence of scarlet fever from 1908, which lasted through the first half of the year; since it has diminished. There were reported some 22,000 cases, of which 15,000 occurred prior to midsummer. The decrease has been altogether in the city of New York, which reports but half the number of cases of 1908. It has continued being distributed over the State at large and indeed more cases occurred outside of the metropolis than in last year. It has been mostly mild, so mild that often it eludes diagnosis. The mortality has fallen to less than 1,200 for the year, which is 500 less than in 1908. The rural mortality is the same as that of last year.

Measles:

This caused a few more deaths than in 1908; it caused more deaths than scarlet fever. There were about 50,000 cases of it reported, those in New York city being less than in 1908. The ratio of deaths was 1 to 40 cases reported, which is one-half the lethality of scarlet fever for the year.

Cerebro-Spinal Meningitis:

Of this 482 cases have been reported, 356 being from New York city. They have been for the most part sporadic. There were 416 deaths. The use of the Flexner serum against it has not become general. The certainty of the diagnosis in all cases

is not perfect; the use of the serum, which is to a degree experimental, has not been desired save in cases determined by a bacteriological diagnosis made by test of the spinal fluid in suspected cases. In some instances it has been found that so-called cases were of tubercular meningitis.

Acute Anterior Poliomyelitis:

There is reason to place this among communicable diseases, since there is certain evidence that it may be transmitted from one person to another, and that it prevails in the form of local epidemics. No one has yet discovered the disease-germ causing it. Its virus operates upon the central nervous system, producing an acute inflammation and localizing either on the anterior horns or columns of the spinal cord, or on the cerebrum or brain, and may eventuate in what is known as infantile paralysis. The area of its epidemic extent is limited and it appears not readily transported from this area, although its subjects, mostly children, contract it by coming into this area. Small epidemics have from time to time occurred, in the eastern part of the State; one of not small extent in and about New York developed two years ago. This year a not inconsiderable outbreak developed in the early fall in the region about Gouverneur, ending in October. Earnest investigation of the disease is being given, its importance being not so much in its fatality as in the unfortunate paralytic results that may attend and follow it.

Pellagra:

This has in recent time attracted attention from its prevalence elsewhere in this country, in the southern states and Illinois. It has heretofore been recognized chiefly in Southern Europe, where it has been epidemic. It is a chronic disease, with an extended period of languor and physical depression, various disturbances of the alimentary organs accompanied with nervous disorders, and affections of the skin, the subject finally dying from a condition of marasmus. The cause for it has long been regarded as the consumption of damaged maize, but on this in more recent time doubt has been thrown. It has not hitherto been recognized in this State, save as occasionally in the discovery of Italian sailors affected with it.

A death was reported from it in the November Bulletin, the subject being a resident of Staten Island, but on further inquiry it has appeared to have been a case of chronic poisoning of another sort. Whether the results of future study will be such as to place it among the epidemic and communicable diseases is possibly yet to be determined.

Ophthalmia Neonatorum:

This has been placed in the list of diseases of which Health Officers are required to make report; forty cases have been reported, no report upon it from New York city being included.

This is the first entire year of work in this direction. It has been taken up for the purpose of saving new-born children from a disease which is almost certain to result in blindness. The disease is not common; it is infrequent enough to occur but few times or possibly not at all in the experience of the average physician. A suitable prophylactic applied to the eyes at birth will prevent its development. Securing its report is only a step towards affecting its control. The chief work upon it this year by the Department has been to induce physicians and mid-wives to habitually and uniformly use preventive measures on the eyes of every new-born child with which they have to do. Pledge cards to do this have during the year been sent to every practising physician in the State outside of New York city, and to every mid-wife whose name could be secured. Return postal cards to this end have been sent to 6,353 physicians and to 157 mid-wives; 3,702 of the former and 56 of the latter have thus far signed this pledge. This work has received general commendation from the medical profession in whatever comment is made in connection with the return of the pledge cards.

There has also been placed on the certificates of birth a question as to whether ophthalmia prophylaxis has been used in the eyes of the child whose birth is reported. The purpose of this is to keep constantly before the obstetrician this measure. Physicians will not misinterpret this as an official demand or as an interference with individual judgment as to treatment, when they reflect upon the importance of the uniform and routine use of a procedure which will prevent a grave disease. During the year a prophy-

lactic outfit consisting of a solution of nitrate of silver with apparatus and directions for its use, has been prepared and a large number sent to health officers for gratuitous distribution to every obstetrician.

DIVISION OF PUBLICITY AND EDUCATION

Monthly Bulletin:

The Monthly Bulletin has been issued regularly during 1909, and has enjoyed a circulation of nearly 10,000 copies per month. It has not only been the means of familiarizing the citizens of the State with the important work of the Department, conceived and carried out for the maintenance and improvement of the public health, but has also exerted a very valuable educative influence and is arousing an increasing intelligent interest in public and personal hygiene. The Department's bulletin takes high rank among publications of this character and is frequently quoted by the public press.

Circulars:

The circulars on the common communicable diseases issued by this Division have been in constant demand. The records show that since the circulars were written, their distribution has been as follows:

Circulars to health officers: On measles and scarlet fever, 5,000; cerebro-spinal meningitis, 5,000; diphtheria, 5,000; smallpox, 5,000; typhoid fever, 5,000; tuberculosis, 5,000; on the diagnosis of smallpox, 2,000.

Circulars for use in families in which communicable disease exists: Diphtheria, 75,000; tuberculosis, 100,000; typhoid fever, 100,000; measles, 150,000; scarlet fever, 100,000; disinfection, 100,000; cerebro-spinal meningitis, 25,000.

Some of these circulars have been printed in Italian, as follows: Diphtheria, 20,000; scarlet fever, 20,000; typhoid fever, 20,000; consumption, 20,000; measles, 20,000; smallpox, 20,000.

The following circulars have been issued for general distribution: Vaccination, 5,000; on the care of vaccination, 5,000; four-page card folder on consumption, 175,000; tuberculosis posters, 1,500; ophthalmia neonatorum, 20,000; directions to mid-wives, 20,000; the teacher and communicable disease, 25,000; the filthy fly, 25,000; care of milk in the home, 1,000.

Annual Sanitary Conference:

The Ninth Annual Conference of Sanitary Officers of the State of New York was held at Rochester on November 10th, 11th and 12th, and was an unqualified success. There was a very large registration of health officers, who listened with marked attention and much profit to the able addresses given by the distinguished speakers whose names appear on the following program:

WEDNESDAY, NOVEMBER 10, 2:30 P. M.

Meeting called to order by George W. Goler, M.D., Health Officer, City of Rochester.

Address of Welcome by Mayor H. H. Edgerton.

Reply by Eugene H. Porter, M.D., State Commissioner of Health.

New Methods in Diagnosis and Treatment of Infectious Diseases. William S. Magill, M.D., Director State Hygienic Laboratory, Albany.

Public Health Work in Ohio. Charles O. Probst, M.D., Secretary Ohio State Board of Health.

Influence of Trades on Disease. Frederick L. Hoffman, Statistician, Prudential Life Insurance Company, Newark, N. J.

8:00 P. M.

Public Health Problems. Eugene H. Porter, M.D.

The People's Interest in Public Health. Rush Rhees, LL.D., President University of Rochester.

Shall We Continue or Shall We Abate the Sewage Pollution of Streams? Prof. W. T. Sedgwick, Massachusetts Institute of Technology.

THURSDAY, NOVEMBER 11, 10 A. M.

A School for Sanitarians. Jacob G. Schurman, LL.D., President Cornell University.

The Public Health Law. Mr. Alec H. Seymour, Secretary, State Department of Health.

The Registration of Tuberculosis. Marshall L. Price, M.D., Secretary, Maryland State Board of Health.

The Cornell Sanitary Laboratory. Prof. H. N. Ogden, C.E., Special Assistant Engineer, State Department of Health.

2:00 P. M.

Prophylaxis of Communicable Diseases. William A. Howe, M.D., Medical Expert, State Department of Health.

The Work of a City Health Department. D. M. Totman, M.D., Health Officer, Syracuse.

The Organization of a City Health Department. George W. Goler, M. D. Health Officer, Rochester.

The Work of a Health Officer. Montgomery E. Leary, M.D., Health Officer, Town Gates.

County Sanitary Organizations. O. J. Hallenbeck, Health Officer, Canandaigua.

FRIDAY, NOVEMBER 12, 10 A. M.

What the Federal Government is Doing for Public Health. Surgeon-General Walter A. Wyman, U. S. Public Health and Marine Hospital Service.

The Investigation of a Typhoid Epidemic. Passed Asst. Surgeon L. L. Lumsden, U. S. Public Health and Marine Hospital Service.

Vital Statistics. Cressy L. Wilbur, M.D., Chief Statistician, U. S. Census Bureau.

2:30 P. M.

Benzoate of Soda in Food. Daniel R. Lucas, M.D., New York City.

The Control of a Milk Supply. Prof. H. A. Harding, Geneva.

The Prevention of Ophthalmia Neonatorum. F. Park Lewis, M.D., Buffalo.

School of Sanitary Science at Cornell University:

The course of lectures on sanitary science and public hygiene offered to the students of Cornell University through the co-operation of the University authorities and the New York State Department of Health was carried out according to schedule during the spring and summer terms of the college year 1908-9, and the fall term of the session 1909-10.

The attendance of students at these lectures was remarkable, taxing the available accommodations. Grateful mention should be made of the fact that many of the lecturers who appeared before the students at the request of this Department, men who have attained eminence in their respective fields as sanitary engineer, statistician, publicist, etc., have no official connection with the Department, and have given their time and services to the cause of public health without recompense. It is to be hoped that through the foundation of a school of sanitary science at Cornell University, the State of New York will put it in the power of the University to offer some sort of compensation for such valuable services.

The list of lecturers and lectures for the first term of the course for 1909-10 is as follows:

October 5. Introductory lecture, outlining field and subject-matter of the course. President J. G. Schurman.

October 7. The History of Therapeutics, showing the barbarism of ancient methods of hygiene and medical knowledge. Dr. G. W. Goler.

October 12. Public Health Administration in General. Dr. Eugene H. Porter.

October 14. State Control of Certain Specified Diseases and Insanitary Conditions. Dr. Eugene H. Porter.

October 19. The Application of the Laws of Heredity to Public Health. Professor S. H. Gage.

- October 21. Cost of Defective Public Health. Professor J. W. Jenks.
 October 26. Governmental Control Over Preventable Diseases. Professor Jenks.
 October 28. Standards of Living and Public Health. Professor Jenks.
 November 2. Personal Hygiene and Public Health. Professor Jenks.
 November 4. Prolongation of Human Life. Professor W. F. Willcox.
 November 9. The Classification of Causes of Death. Professor Willcox.
 November 11. Disease and Its Problems for Philanthropy. Professor F. A. Fetter.
 November 16. Health and Its Promotion by Philanthropy. Professor Fetter.
 November 18. The Birth Rate. Professor Willcox.
 November 23. Marriage and Divorce. Professor Willcox.
 November 30. The Nature of Disease. Dean V. A. Moore.
 December 2. Micro-Organisms and Their Relation to Disease. Dean Moore.
 December 7. Diseases of Animals Transmissible to Man. Dean Moore.
 December 9. The Influence of Mind Upon Private and Public Health. Professor E. B. Titchener.
 December 14. Problems of Life and Health in Industry. Frederick L. Hoffman.
 December 16. Insanity and Public Health. Dr. W. L. Russell.
 December 21. Diphtheria Antitoxin and Its Preparation. Dr. Wm. S. Magill.

Addresses and Lectures:

In furtherance of its educational policy, the Commissioner and members of the Department have from time to time during the past year addressed public meetings and gatherings of medical men. Some of these addresses have been on various aspects of public health work, some have been devoted to a discussion of local sanitary problems, and a large number have been given in connection with the campaign against tuberculosis which is being waged throughout the State under the joint auspices of this Department and the New York State Charities Aid Association.

DIVISION OF VITAL STATISTICS

The total reported mortality for 1909 was 140,261, which based upon an estimated population of 8,699,643, shows the death rate to have been 16.1 per 1,000 population, as compared with 16.3 for 1908. There was but very little difference in the urban and rural death rate.

There were 202,656 births reported, which is 503 less than the number reported for 1908, and the birth rate dropped from 23.8 to 23.3 in 1909. The decrease in births was due no doubt to the large decrease in marriages occurring in 1908 as compared

with 1907, the net decrease in the registration districts in the State being 19,104, or 20.7 per cent.

Complete returns of marriages occurring in the State during 1909 are still lacking at the Department, but reports received from the county clerks indicate that there were about 80,000, as compared with 92,421 in 1907 and 73,317 in 1908.

Pulmonary tuberculosis causes 13,996 deaths. In 1908 there were 14,347, and the year before 14,431. While there was a decrease in the death rate from tuberculosis from 167.5 in 1908 to 160.3 in 1909, the percentage of all deaths due to tuberculosis remains nearly stationary — 10.0.

During the last twenty-five years during which the population of the State has increased from 5,600,000 to 8,600,000, there have been 330,000 deaths from pulmonary tuberculosis — a yearly average of 13,200.

The urban mortality from tuberculosis during 1909 was 175 per 100,000 population, and the rural 120.

There were 2,112 deaths from tuberculosis other than pulmonary, viz.: Laryngeal, 127; meningeal, 1,113; abdominal, 390; Potts disease, 92; tuberculous abscess, 27; general tuberculosis, 165; other tubercular diseases, 207, making a total of 16,117 deaths from tuberculosis, or 11.5 per cent. of the total deaths occurring in this State.

Pneumonia caused 9,423 deaths, 796 more than in 1908. Influenza was given as the cause of 1,122 deaths. From other diseases of the respiratory organs there were 11,406 deaths.

Cancer caused 7,060 deaths, which is an increase of 406 over the reported mortality for 1908. The urban death rate was 78 per 100,000 population, and the rural 86. In 1908 it was 74 and 79, and in 1907 it was 76 and 77, respectively. The average yearly deaths from cancer during the past 25 years is 4,227, the reported mortality having increased from 1,887 in 1885 to 7,034 in 1909, and the death rate has increased from 33.6 to 80.0 per 100,000 population.

Bright's disease caused 9,393 deaths — 6,743 urban and 2,650 rural — an increase of 871 over 1908.

Violence was the cause of 9,232 deaths — 6,794 urban and 2,438 rural. The rate of deaths per 100,000 population in the

two social classes was nearly identical — 107 and 104. The total number was about the same as in 1908 (9,183).

There were 1,494 deaths by suicide, which is 12 less than in 1908, and 279 more than occurred in 1907. The chief modes of death were from firearms, 412; poisoning, 341, and asphyxia, 308. There were 62 suicides from drowning and 201 by hanging.

The mortality from typhoid fever was 1,315, which is 60 less than in 1908. The death rate from typhoid fever is the lowest ever recorded in the State, being 15.0 per 100,000 population.

There were 7,873 deaths from diarrhea and enteritis under two years of age — 1,238 less than in 1908, and 1,940 less than in 1907. Of these deaths, 85 per cent. were urban.

The childhood mortality was a little under that of 1908, the saving being in the first year of life, and mostly in the urban population. Compared with 1907 the decrease is more marked, about 2,000 fewer deaths occurring under one year of age — principally in the urban mortality. The mortality between one and five years of age shows no material change.

Diphtheria continues to be an urban disease, the mortality in Greater New York being 38 per 100,000 population, and the continued rate in all of the cities was little less (32), while in rural parts of the State there were but 10 deaths per 100,000 population. The total mortality from diphtheria was 2,313, which is slightly under that of 1908.

There were 1,205 deaths from scarlet fever, and 1,272 from measles.

Cerebro-spinal meningitis caused 485 deaths.

The total mortality from epidemic diseases was 9,049, or 6.5 per cent. of the deaths from all causes. Including pneumonia and tuberculosis, there were 32,468 deaths from zymotic diseases, or 23.0 per cent. of all deaths.

Old age mortality is increased by 1,573 as compared with that of 1908 — 43,298 deaths, a little more than one-third of the total, having occurred at and over the age of sixty.

Respectfully submitted,

EUGENE H. PORTER,

State Commissioner of Health

February 15, 1910

APPENDIX
FINANCIAL STATEMENT

[55]

FINANCIAL STATEMENT

DISBURSEMENTS FOR THE FISCAL YEAR ENDING SEPTEMBER 30, 1909

Division of Administration

Eugene H. Porter, M.D., Commissioner.....	\$4,500 00
Alec H. Seymour, secretary.....	3,000 00
Fenimore D. Beagle, chief clerk and registrar....	2,400 00
Edward C. Kenny, stenographer.....	1,500 00
Marion L. Peters, stenographer.....	1,080 00
Harry Crotty, page	480 00
	<hr/>
	\$12,960 00
	<hr/>

Division of Engineering

Theodore Horton, chief engineer.....	\$4,500 00
H. B. Cleveland, principal assistant engineer....	2,400 00
Henry N. Ogden, special assistant engineer....	1,335 00
Chas. A. Holmquist, assistant engineer.....	1,250 00
Henry W. Taylor, assistant engineer.....	158 33
Homer L. Higley, stenographer.....	1,080 00
	<hr/>
	\$10,723 33
	<hr/>

Division of Vital Statistics

Charles E. Thompson, clerk.....	\$1,500 00
A. K. Cole, clerk.....	1,500 00
William A. Wallace, clerk.....	1,500 00
Jeremiah Grogan, jr., clerk.....	1,200 00
Ella H. Porter, clerk.....	900 00
Rae Samuels, clerk.....	690 00
Meta E. Mills, clerk.....	720 00
Anna B. Byrne, clerk.....	810 00

Eleanore C. Gibb, junior clerk.....	\$570 00
Estelle Jarvis, junior clerk.....	570 00
	<hr/>
	\$9,960 00
	<hr/>

Division of Communicable Diseases

*John T. Wheeler, M.D., director.....	\$258 06
Wm. A. Howe, M.D., director.....	294 33
Cora Partridge, clerk.....	900 00
Alice M. Fuller, stenographer.....	850 61
	<hr/>
	\$2,303 00
	<hr/>

TEMPORARY EMPLOYEES

Minnie S. Warner, clerk.....	\$85 32
Cecelia Martin, stenographer.....	166 66
Ruth Van Noy, stenographer.....	50 00
Helen McQuide, telephone operator.....	64 00
	<hr/>
	\$365 98
	<hr/>

ANTITOXIN LABORATORY

Herbert D. Pease, M.D., director.....	\$3,208 26
Mott C. Cunningham, bacteriologist.....	600 00
Wm. S. Magill, M.D., bacteriologist.....	330 64
I. H. Lindsay, clerk.....	1,200 00
Grace McCullom, stenographer.....	600 00
Mrs. J. Cruickshank, cleaner.....	480 00
Mrs. Fannie Mainster, cleaner.....	465 00
Mrs. Charles Schadler, cleaner.....	198 00
Margaret Hill, cleaner.....	360 00
Jennie A. Marsh, cleaner.....	392 00
Charles Schadler, stableman.....	600 00
Walter Reynolds, assistant stableman.....	480 00
	<hr/>
	\$8,913 90
	<hr/>

* Deceased.

FINANCIAL STATEMENT

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<i>Disbursements</i>			1908-09
Oct.,	1908.	Sundries	\$411 60
		Salaries	803 16
			<hr/>
			\$1,214 76
Nov.,	1908.	Sundries	\$944 84
		Salaries	835 16
			<hr/>
			1,780 00
Dec.,	1908.	Sundries	\$260 51
		Salaries	843 16
			<hr/>
			1,103 67
Jan.,	1909.	Sundries	\$573 94
		Salaries	848 16
			<hr/>
			1,422 10
Feb.,	1909.	Sundries	\$700 76
		Salaries	698 16
			<hr/>
			1,398 92
Mar.,	1909.	Sundries	\$1,166 15
		Salaries	698 16
			<hr/>
			1,864 31
April,	1909.	Sundries	\$585 74
		Salaries	698 16
			<hr/>
			1,283 90
May,	1909.	Sundries	\$705 42
		Salaries	698 16
			<hr/>
			1,403 58
June,	1909.	Sundries	\$354 36
		Salaries	698 16
			<hr/>
			1,052 52
July,	1909.	Sundries	\$837 20
		Salaries	698 16
			<hr/>
			1,535 36
Aug.,	1909.	Sundries	\$496 20
		Salaries	903 80
			<hr/>
			1,400 00
Sept.,	1909.	Sundries	\$2,050 78
		Salaries	491 50
			<hr/>
			2,542 28
			<hr/>
			\$18,001 40

HYGIENIC LABORATORY

Leonard M. Wachter, chemist.....	\$2,100 00
A. J. Slack, assistant chemist.....	990 00
W. G. Fellows, assistant bacteriologist.....	940 00
Blanche C. Vose, cleaner.....	480 00
T. G. Conklin, laborer.....	560 00
H. C. Kniffen, laborer.....	120 00

\$5,190 00

Disbursements

Oct., 1908.	Sundries	\$67 45	
	Salaries	410 00	
			\$477 45
Nov., 1908.	Sundries	\$138 73	
	Salaries	410 00	
			548 73
Dec., 1908.	Sundries	\$48 98	
	Salaries	470 00	
			518 98
Jan., 1909.	Sundries	\$34 86	
	Salaries	470 00	
			504 86
Feb., 1909.	Sundries	\$460 34	
	Salaries	435 00	
			895 34
Mar., 1909.	Sundries	\$79 49	
	Salaries	435 00	
			514 49
April, 1909.	Sundries	\$94 46	
	Salaries	435 00	
			529 46
May, 1909.	Sundries	\$1,361 59	
	Salaries	435 00	
			1,796 59
June, 1909.	Sundries	\$30 40	
	Salaries	435 00	
			465 40

FINANCIAL STATEMENT

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July, 1909.	Sundries	\$726 83	
	Salaries	435 00	
			\$1,161 83
Aug., 1909.	Sundries	\$55 23	
	Salaries	455 00	
			510 23
Sept., 1909.	Sundries	\$1,711 61	
	Salaries	365 00	
			2,076 61
			<u>\$9,999 97</u>

CANCER LABORATORY

H. R. Gaylord, M.D., director.....	\$3,208 26
G. H. A. Clowes, chemist.....	2,291 63
Gary N. Calkins, biologist.....	300 00
F. W. Baeslack, assistant biologist.....	800 00
C. A. Macclay, secretary.....	825 00
D. Averill, assistant in photo-chemistry.....	842 00
F. A. Payne, janitor.....	360 00
Edward Kempkes, laborer.....	100 00
M. Weber, laborer.....	58 00
Jesse McCarney, laborer.....	307 00
Jas. Duff, laborer.....	87 50
Chas. M. Stuart, laborer.....	52 50
Guy Owen, laborer.....	390 00
Arthur Johnson, laborer.....	150 00
Fred West, laborer.....	450 00
Ed. Sears, laborer.....	646 00
	<u>\$10,867 89</u>

Disbursements

Oct., 1908.	Sundries	\$777 77	
	Salaries	1,053 49	
			\$1,831 26
Nov., 1908.	Sundries	\$669 61	
	Salaries	1,099 49	
			1,769 10

Dec., 1908.	Sundries	\$882 78	
	Salaries	1,076 99	
			\$1,959 77
Jan., 1909.	Sundries	\$584 32	
	Salaries	956 99	
			1,541 31
Feb., 1909.	Sundries	\$545 17	
	Salaries	956 99	
			1,502 16
Mar., 1909.	Sundries	\$545 90	
	Salaries	956 99	
			1,502 89
April, 1909.	Sundries	\$455 23	
	Salaries	969 99	
			1,425 22
May, 1909.	Sundries	\$559 38	
	Salaries	972 99	
			1,532 37
June, 1909.	Sundries	\$847 69	
	Salaries	581 33	
			1,429 02
July, 1909.	Sundries	\$492 21	
	Salaries	872 99	
			1,365 20
Aug., 1909.	Sundries	\$447 42	
	Salaries	872 99	
			1,320 41
			<u>\$17,178 71</u>

INVESTIGATIONS

Monthly Expenditures

October, 1908	\$787 10
November, 1908	520 87
December, 1908	1,031 80
January, 1909	717 42
February, 1909	362 95
March, 1909	276 93

FINANCIAL STATEMENT

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April, 1909	\$400 64
May, 1909	135 85
June, 1909	252 68
July, 1909	1,254 01
August, 1909	1,090 70
September, 1909	1,111 11

\$7,942 06

Disbursements

Annual conference of sanitary officers	\$1,129 40
Investigation of public water supplies, stream pollution, etc.	1,580 47
Investigation of sanitary condition of summer resorts	1,085 29
Investigation of shellfish grounds	539 12
Investigation of sight and hearing of school children	516 06
Investigation of public milk supplies	309 50
Investigation of proposed sites for tuberculosis hospitals	297 85
Investigation of smoke nuisance on Staten Island	183 49
Miscellaneous investigations — public nuisances, etc.	2,300 88

\$7,942 06

OFFICE EXPENSES

Monthly Expenditures

October, 1908	\$1,702 36
November, 1908	614 59
December, 1908	918 92
January, 1909	541 52
February, 1909	599 18
March, 1909	719 49
April, 1909	1,445 18
May, 1909	845 13
June, 1909	728 45

July, 1909	\$474 73
August, 1909	580 80
September, 1909	313 26
	<hr/>
	\$9,483 61
	<hr/>

Disbursements

Printing — publication of monthly bulletin, blanks for registration of vital statistics, etc.	\$6,019 66
Filing cases and office supplies.	1,966 63
Books and subscriptions.	271 89
Telephone service	744 38
Telegraph service	481 05
	<hr/>
	\$9,483 61
	<hr/>

Division of Engineering — instruments, books, fur- niture and office supplies.	\$1,000 48
	<hr/>

Printing marriage record blanks, registers and in- dex books to carry out the provisions of chapter 742 of the Laws of 1907.	\$2,300 98
	<hr/>

Postage	\$2,900 00
Expressage, freight, etc.	2,080 43
	<hr/>
	\$4,980 43
	<hr/>

SUPPRESSION OF EPIDEMICS OF SMALLPOX AND OTHER CON-
TAGIOUS AND INFECTIOUS DISEASES

Monthly Expenditures

October, 1908	\$125 30
November, 1908	602 00
December, 1908	734 08
January, 1909	1,163 06
February, 1909	458 37
March, 1909	388 57

April, 1909	\$1,220 38
May, 1909	965 79
June, 1909	813 94
July, 1909	561 29
August, 1909	295 15
September, 1909	324 11

\$7,652 04

Disbursements

Printing and supplies	\$1,773 36
Services and expenses of medical experts, as follows:	

Dr. F. C. Curtis	1,992 94
Dr. Hills Cole	900 00
Dr. Wallace Clark	157 21
Dr. C. W. Crispell	479 30
Dr. Charles W. Bibbins	136 40
Dr. Frederick J. Mann	56 50
Dr. W. H. Connelly	44 35
Dr. Edward Clark	72 87
Dr. E. H. Hutton	23 50
Dr. B. W. Sherwood	11 40
Dr. O. W. Peck	13 32
Dr. A. G. Wilding	84 70
Dr. John B. Huber	1,032 88
Dr. Z. F. Dunning	23 00
Dr. Jno. W. Le Seur	60 00
Dr. W. B. Gibson	14 87
Dr. E. S. Willard	39 94
Dr. H. A. Eastman	14 00
Dr. Frank W. Adriance	25 00
Dr. Arthur W. Booth	25 00
C. W. Fetherolf	500 00
Paul Bernhardt	160 00
Geo. A. Deel	11 50

\$7,652 04

OPHTHALMIA NEONATORUM

Furnishing local health officers with ophthalmia

neonatorum outfits..... \$785 44

TRAVELING EXPENSES

Disbursements

October, 1908	\$687 20
November, 1908	536 51
December, 1908	739 02
January, 1909	327 12
February, 1909	373 93
March, 1909	317 11
April, 1909	634 44
May, 1909	486 80
June, 1909	546 38
July, 1909	386 10
August, 1909	214 40
September, 1909	574 36

 \$5,823 37
Expended for Following Purposes

Miscellaneous investigations — public nuisances, etc.	\$1,388 56
Investigating public water supplies, sewage dis- posal, etc.	1,222 67
Investigating shellfish grounds	353 34
Investigating public milk supplies.	302 41
Investigating sanitary conditions of cities.	176 95
Expenses of lecturers and members of advisory board in tuberculosis campaign; meetings of county medical societies; sanitary school at Cor- nell College, etc.	2,190 84
Expenses in connection with annual conference of sanitary officers, and Department's exhibition at State Fair	188 60

 \$5,823 37

 Traveling expenses of Commissioner..... \$1,457 30

TUBERCULOSIS EXHIBITION

Monthly Expenditures

October, 1908	\$1,132 35
November, 1908	1,525 81
December, 1908	979 52
January, 1909	349 68
March, 1909.....	12 10
April, 1909	2 00
May, 1909	1 40
June, 1909	1,733 73
July, 1909	636 39
August, 1909	343 00
September, 1909	347 85
	<hr/>
	\$7,063 83
	<hr/>

Disbursements

For labor, material, repairs and necessary supplies for tuberculosis exhibition.....	\$1,681 29
Salaries of director, lecturers and laborers.....	2,325 00
Traveling expenses of director, lecturers, etc., with exhibition in New York State and at Interna- tional Cong. Tub. at Washington.....	1,762 19
Rent of rooms for exhibition.....	285 00
Transportation of exhibition in New York State and at Int. Cong. Tub. at Washington.....	597 09
Printing, etc.	361 01
Telephone service	52 25
	<hr/>
	\$7,063 83
	<hr/>

TOTAL EXPENDITURES FOR THE YEAR

Division of Administration.....Salaries.....	\$12,960 00
Division of Engineering.....Salaries.....	10,723 33
Division of Vital Statistics.....Salaries.....	9,960 00
Division of Communicable Diseases.Salaries.....	2,303 00
Temporary employees	365 98
	<hr/>
	\$36,312 31
	<hr/>

Antitoxin Laboratory	Salaries... \$8,913 90	
	Sundries.. 9,087 50	
	<hr/>	\$18,001 40
Cancer Laboratory	Salaries... \$10,867 89	
	Sundries.. 6,310 82	
	<hr/>	17,178 71
Hygienic Laboratory	Salaries... \$5,190 00	
	Sundries.. 4,809 97	
	<hr/>	9,999 97
Investigations		7,942 06
Office expenses — General	\$9,483 61	
Division of Engineering	1,000 48	
Marriage license blanks	2,300 98	
	<hr/>	12,785 07
Postage and transportation		4,980 43
Suppression of smallpox and other communicable diseases		7,652 04
Prevention of Ophthalmia Neonatorum		785 44
Traveling expenses — General	\$5,823 37	
Of Commissioner	1,457 30	
	<hr/>	7,280 67
Tuberculosis exhibition		7,063 83
		<hr/>
		\$129,981 93
		<hr/>

DIVISION
OF
VITAL STATISTICS

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DIVISION OF VITAL STATISTICS

ALBANY, N. Y., April 15, 1910.

HON. EUGENE H. PORTER, *State Commissioner of Health,*
Albany, N. Y.:

SIR:—I have the honor to herewith transmit the following report covering the work in the Division of Vital Statistics for the year 1909.

It is gratifying to note that the efforts of the Department to bring about a more complete registration of births and deaths in the State is meeting with success.

Important amendments were made to the registration laws at the last session of the Legislature, requiring the filing of birth certificates within thirty-six hours after a birth occurs, and the reporting of deaths within twenty-four hours after death occurs.

Through the earnest efforts of the Department to see that local boards of health adopt and enforce local ordinances requiring compliance with the provisions of section 22 of the Public Health Law, a decided improvement in the registration throughout the State has been noticeable.

The amendments above noted have resulted in a more prompt and complete filing of certificates of births and deaths.

During the year a new standard form of birth and death certificates was prescribed and furnished local boards of health for the proper recording of births and deaths occurring in the State.

The new death certificate is the same form as that approved by the United States Census Bureau and American Public Health Association. The adoption of a uniform certificate will greatly facilitate the study and comparison of mortality statistics.

In addition to supplying the local boards of health with the necessary blanks for the proper registration of births and deaths, the Department has furnished the county clerks with the blank forms required to carry out the provisions of the marriage license law. Reports received from the town and city clerks, who issue the marriage licenses, confirm the statement made last year—that the law has grown in favor and proven beneficial to society.

The total reported mortality was 140,261, which based upon an estimated population of 8,699,643, shows the death rate to have

been 16.1 per 1,000 population, as compared with 16.3 for 1908. There was but very little difference in the urban and rural death rate.

There were 202,656 births reported, which is 503 less than the number reported for 1908, and the birth rate dropped from 23.8 to 23.3 in 1909. The decrease in births was due no doubt to the large decrease in marriages occurring in 1908 as compared with 1907, the net decrease in the registration districts in the State being 19,104, or 20.7 per cent., as it is well known that there is a steady improvement in the registration of births occurring in the State.

Total Registration in State Since 1885

The following table shows the total registration of births, deaths and marriages occurring in the State since 1885.

YEAR	Population	*Births	Deaths	Marriages	Birth rate	Death rate	Marriage rate
1885.....	5,609,910	63,536	80,407	24,409	11.3	14.3	4.4
1886.....	5,719,855	89,828	86,801	36,764	15.7	15.2	6.4
1887.....	5,831,947	102,038	108,269	44,438	17.5	18.6	7.6
1888.....	5,946,246	103,089	114,584	43,683	17.3	19.3	7.3
1889.....	6,062,764	114,804	113,155	50,960	18.8	18.6	8.4
1890.....	6,182,600	112,572	128,648	41,195	18.2	20.8	6.7
1891.....	6,316,333	125,909	129,850	51,458	19.9	20.5	8.1
1892.....	6,438,283	130,143	131,388	52,725	20.2	20.3	8.1
1893.....	6,537,716	136,297	129,659	52,805	20.8	19.7	8.1
1894.....	6,638,696	141,827	123,423	52,539	21.4	18.6	7.9
1895.....	6,741,246	142,311	128,834	59,059	21.1	19.1	8.7
1896.....	6,845,375	147,327	126,253	58,990	21.5	18.4	8.6
1897.....	6,951,111	144,631	118,525	57,530	20.8	17.1	8.3
1898.....	7,058,459	138,702	122,584	57,392	19.7	17.4	8.1
1899.....	7,167,491	136,778	121,831	61,167	19.1	17.0	8.5
1900.....	7,281,533	143,156	132,089	63,225	19.7	18.1	8.7
1901.....	7,434,896	140,539	131,335	65,216	18.9	17.7	8.8
1902.....	7,591,491	146,740	124,830	68,903	19.3	16.4	9.1
1903.....	7,751,375	158,343	127,498	73,011	20.4	16.4	9.4
1904.....	7,914,636	165,014	142,217	74,677	20.8	18.0	9.4
1905.....	8,081,333	172,259	137,435	78,261	21.3	17.0	9.7
1906.....	8,251,538	183,012	141,099	87,870	22.2	17.1	10.7
1907.....	8,425,333	196,020	147,130	92,421	23.3	17.5	11.0
1908.....	8,546,356	203,159	138,912	72,286	23.8	16.3	8.4
1909.....	8,699,643	202,656	140,261	80,233	23.3	16.1	9.2

* Still births excluded.

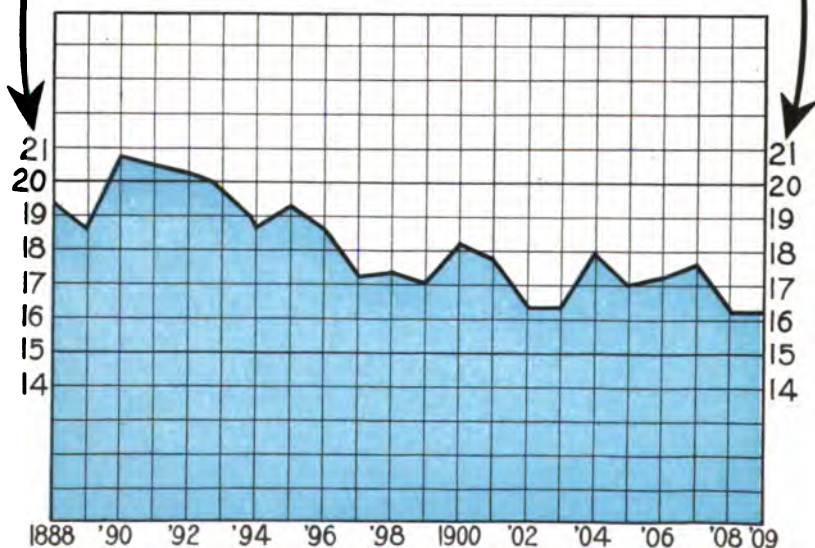
Registration of Births

While there is a steady improvement in the registration of births, many local boards of health are slack in enforcing strict compliance with the provisions of section 22 of the Public Health Law, and the Department is constantly receiving delayed returns.

Beginning with the present year the returns from each registration district have been checked up each month, and where it is found that the law is not being enforced, notice is served on the

DIAGRAM SHOWING FLUCTUATIONS OF THE DEATH RATE PER THOUSAND

IN THE STATE
OF NEW YORK
SINCE 1888.



NEW YORK STATE DEPARTMENT OF HEALTH



local board of health to correct existing defects, and thus far there has been a noticeable improvement in the prompt reporting of births.

The effectiveness of the requirements to report births within thirty-six hours after the birth occurs, has been plainly shown in the city of Rochester, where the local health authorities are enforcing the law. During the first quarter of the present year there were 25 per cent. more births reported in the city than during the corresponding period the previous year.

The cities of Niagara Falls, Watertown, Rome, Middletown, Cortland, Plattsburg and Johnstown show a like increase, while other cities show a most satisfactory increase in the registration of births.

The increase in the rural districts is not so perceptible, owing to some extent, no doubt, to the small birth rate as compared with the cities.

The following table shows the number of births which were reported as having occurred in 1909, classified by the month for which the report was received.

MONTH	Total living births	White	Colored	TOTAL			Still births
				Male	Female	Not stated	
January.....	16,389	16,150	239	8,384	8,002	3	1,133
February.....	15,066	14,846	220	7,776	7,289	1	797
March.....	16,902	16,637	265	8,733	8,167	2	871
April.....	15,069	14,874	195	7,695	7,371	3	832
May.....	14,974	14,780	194	7,902	7,069	3	827
June.....	16,277	16,049	228	8,232	8,038	7	781
July.....	17,590	17,372	218	9,022	8,565	3	816
August.....	16,970	16,714	256	8,870	8,095	5	743
September.....	16,894	16,666	228	8,672	8,219	3	803
October.....	17,306	17,086	220	8,948	8,355	3	783
November.....	17,007	16,793	214	8,734	8,267	6	820
December.....	22,212	21,942	270	11,392	10,816	4	863
Total.....	202,656	199,909	2,747	104,360	98,253	43	10,069

The 2,747 colored births were classified as follows: Negro, 2,694; Indian, 29; Mongolian, 24. Of the 202,656 living births, 2,660 were premature.

Marriages

The following table shows the number of marriages reported in the State during 1907 — year preceding the enactment of the Marriage License Law — and those reported since the enactment of the new law.

The decrease in the number of marriages occurring during 1908, compared with 1907, was 21.7 per cent., while the returns for 1909 show a net decrease of 12.2.

The marriage rate increased from 8.4 in 1908 to 9.2 in 1909.

The effect of the Marriage License Law on nonresident marriages is shown by the large decrease in the number of marriages occurring in the counties of Broome, Cattaraugus, Chautauqua, Chemung, Steuben and Tioga, bordering on Pennsylvania. Compared with 1907, there was a decrease of 49.7 per cent. in 1908, and 43.7 in 1909.

Marriages in New York State

COUNTY	1907	1908	1909	COUNTY	1907	1908	1909
Albany.....	1,331	1,209	1,295	Oneida.....	996	1,186	1,293
Allegany.....	469	317	330	Onondaga.....	1,423	1,278	1,405
Broome.....	1,461	691	726	Ontario.....	419	329	352
Cattaraugus.....	1,021	594	580	Orange.....	1,008	727	783
Cayuga.....	632	485	523	Orleans.....	227	191	240
Chautauqua.....	2,147	980	1,154	Oswego.....	571	471	550
Chemung.....	910	472	555	Otsego.....	438	324	338
Chenango.....	296	226	251	Putnam.....	145	114	96
Clinton.....	499	350	419	Queens.....	1,490	1,292	1,647
Columbia.....	371	254	288	Rensselaer.....	998	916	900
Cortland.....	231	195	214	Richmond.....	594	425	450
Delaware.....	395	355	371	Rockland.....	308	231	264
Dutchess.....	782	538	540	St. Lawrence.....	884	567	685
Erie.....	5,375	3,917	4,178	Saratoga.....	553	366	399
Essex.....	300	216	255	Schenectady.....	775	574	577
Franklin.....	436	299	371	Schoharie.....	196	155	147
Fulton.....	411	341	382	Schuyler.....	178	95	112
Genesee.....	271	272	271	Seneca.....	167	158	161
Greene.....	250	220	231	Steuben.....	963	547	685
Hamilton.....	34	34	34	Suffolk.....	628	553	544
Herkimer.....	399	391	511	Sullivan.....	270	242	218
Jefferson.....	891	571	801	Tioga.....	502	238	239
Kings.....	12,916	11,664	12,714	Tompkins.....	310	233	240
Lewis.....	178	152	195	Ulster.....	716	555	580
Livingston.....	302	225	242	Warren.....	358	254	243
Madison.....	315	274	318	Washington.....	445	382	359
Monroe.....	2,529	2,058	2,393	Wayne.....	458	336	375
Montgomery.....	506	532	560	Westchester.....	2,650	1,848	2,054
Nassau.....	474	472	558	Wyoming.....	298	226	227
New York.....	36,097	29,550	31,596	Yates.....	124	113	136
Niagara.....	1,100	735	827				
				Total.....	94,421	73,515	80,233

Deaths

The amendments to sections 22 and 23 of the Public Health Law requiring physicians to file certificates of deaths with the local registrar within twenty-four hours after death occurs, and authorizing the registrar and health officer only to issue burial permits, has resulted in returns of deaths being more promptly filed with the local registrar, and made it possible for the Department to publish nearly accurate mortality statistics in the Monthly Bulletin.

During the year the Department was obliged to return 3,386 defective certificates for correction. This is 500 less than were returned the year previous, and as the Department requires more complete information as to cause of death than heretofore, this decrease in the number of defective certificates shows that the Department is receiving more satisfactory returns of deaths.

There is a steady increase from year to year in the demand for certified copies of certificates of births, marriages and deaths filed with the Department to be used for legal purposes. The number of requests received during the year were 1,046.

City Registration

The following table shows the registration of births, marriages and deaths in the cities of the State; the birth and death rate for 1909, and the average rates for the previous five years:

	Estimated population, 1909	Births	Deaths	Mar- riages	RATE PER 1,000 POPULATION			
					1909		AVERAGE FOR PAST FIVE YEARS	
					Birth	Death	Birth	Death
Albany.....	100,730	1,238	1,759	784	12.3	17.5	11.9	18.3
Amsterdam.....	25,267	756	423	355	29.9	16.7	20.8	16.8
Auburn.....	34,272	615	499	325	17.9	14.6	19.4	17.6
Binghamton.....	45,855	933	712	491	20.3	15.5	17.3	16.2
Buffalo.....	396,535	9,027	6,111	3,542	22.8	15.4	22.0	15.7
Cohoes.....	24,185	503	488	195	20.8	20.2	17.9	19.7
Corning.....	15,339	253	217	137	16.5	14.1	17.9	16.7
Cortland.....	12,538	220	182	96	17.5	12.9	16.3	13.6
Dunkirk.....	18,061	535	202	164	29.6	11.2	34.1	15.5
Elmira.....	35,765	537	546	422	15.0	15.3	15.8	15.5
Fulton.....	11,759	219	167	101	18.6	14.2	19.7	14.8
Geneva.....	13,543	254	175	108	18.8	12.9	18.8	14.6
Gloversville.....	18,761	388	300	214	20.7	16.0	16.8	15.2
Glens Falls.....	16,279	242	226	116	14.9	13.9	14.9	15.2
Hornell.....	14,126	291	185	113	20.6	13.1	18.8	14.9
Hudson.....	11,032	198	172	71	17.9	15.6	17.1	19.1
Ithaca.....	15,584	289	211	127	18.5	13.5	14.9	15.7
Jamestown.....	28,495	575	343	480	20.1	12.0	20.5	11.9
Johnstown.....	9,473	156	155	94	16.5	16.4	17.2	13.5
Kingston.....	26,110	502	519	170	19.2	19.9	21.8	18.3
Lackawanna.....	11,370	171	150	19	15.0	13.2	.....	.....
Little Falls.....	11,563	323	183	186	22.8	15.8	18.9	13.4
Lockport.....	18,105	373	276	155	20.6	15.2	18.1	15.1
Middletown.....	16,610	279	258	131	16.8	15.4	15.1	16.8
Mount Vernon.....	27,891	798	392	220	28.7	14.1	26.3	15.2
Newburgh.....	27,418	456	471	220	16.6	17.2	19.3	19.2
New Rochelle.....	24,920	727	323	198	29.2	13.0	26.1	14.1
New York (Greater).....	4,450,963	122,867	74,105	46,407	27.5	16.6	27.2	18.4
Manhattan.....	2,305,196	62,990	37,961	31,596	27.3	16.5	29.1	18.0
Bronx.....	328,480	9,574	6,426	.....	29.1	19.6	26.9	20.7
Brooklyn.....	1,505,925	41,494	24,365	12,714	27.6	16.2	25.6	17.4
Queens.....	233,709	6,817	3,838	1,647	27.0	16.4	25.3	16.6
Richmond.....	77,673	1,422	1,515	450	25.6	19.5	25.5	20.0
Niagara Falls.....	32,012	664	465	356	20.7	14.5	19.9	16.1
North Tonawanda.....	10,987	330	162	114	30.0	14.7	25.6	13.9
Ogdensburg.....	14,921	355	245	139	23.8	16.4	22.0	19.1
Olean.....	18,000	307	211	153	17.1	11.7	21.5	13.5
Oneida.....	10,099	138	139	72	13.7	13.8	18.4	14.8
Oneonta.....	8,794	157	152	85	17.5	17.3	.....	.....

* Includes marriages for Borough of Bronx.

City Registration—Continued

	Estimated population, 1909	Births	Deaths	Mar- riages	RATE PER 1,000 POPULATION			
					1909		AVERAGE FOR FIFT FIVE YEARS	
					Birth	Death	Birth	Death
Oswego.....	22,528	481	336	177	21.4	14.9	18.5	16.9
Plattsburgh.....	11,450	223	199	151	19.5	17.4	20.5	14.7
Port Jervis.....	9,943	172	183	69	17.3	18.4	17.7	18.2
Poughkeepsie.....	26,039	542	501	212	20.8	19.2	20.8	18.9
Rensselaer.....	13,368	181	174	64	13.5	13.0	14.2	15.2
Rochester.....	196,793	4,292	2,913	1,912	21.8	14.8	21.1	15.2
Rome.....	18,917	480	382	154	25.4	20.2	22.8	20.0
Schenectady.....	73,037	1,774	846	504	24.3	11.6	25.4	15.5
Syracuse.....	125,378	2,661	1,947	1,036	21.2	15.5	18.0	15.8
Tonawanda.....	7,315	184	105	49	25.2	14.3	18.2	12.4
Troy.....	77,242	985	1,487	609	12.8	19.3	12.1	21.0
Utica.....	69,458	1,807	1,153	698	26.0	16.0	22.6	18.9
Watertown.....	28,140	507	423	259	18.0	15.0	18.8	17.2
Watervliet.....	14,609	195	230	130	13.3	15.7	14.0	17.5
Yonkers.....	72,200	1,961	1,125	704	27.2	15.6	24.8	17.0

The above table includes deaths of nonresidents occurring in the cities, except in the following cities, where deaths occurring in State institutions are excluded: Auburn State Prison, Binghamton State Hospital, Elmira Reformatory, Middletown State Hospital, Ogdensburg, St. Lawrence State Hospital, Rome State Custodial Asylum, Utica State Hospital.

Average city death rate, 1909....15.3 Average city birth rate..... 20.3

Total Registration in the State by Districts

The following tables show the total registration of births, deaths and marriages in the registration districts of the State, by counties, and includes delayed certificates of births, but not deaths occurring in the following institutions:

Auburn State Prison, 20; Binghamton State Hospital, 161; Bloomingdale Asylum (White Plains), 17; Craig Colony (Son-yea), 118; Dannemora State Hospital, 24; Elmira State Reformatory, 5; Gowanda State Hospital, 56; Hudson River State Hospital, 240; Long Island State Hospital (Kings Park), 216; Manhattan State Hospital (Central Islip), 359; Matteawan State Hospital, 28; Middletown State Hospital, 88; New York State Soldiers and Sailors' Home (Bath), 257; Rochester State Hospital, 139; Rome Custodial Asylum, 55; St. Lawrence State Hospital (Ogdensburg), 173; Sing Sing State Prison (Ossining), 9; Utica State Hospital, 115; Willard State Hospital (towns of Romulus and Ovid, Seneca county), 132.

The number of marriages given includes only those reported to this Department at the close of the year by the county clerks. Complete statistics by counties appear on page 74.

Albany County

	Popula- tion	BIRTHS		DEATHS		MARRIAGES	
		1909	1908	1909	1908	1909	1908
Albany, city	98,374	1,238	1,254	1,759	1,842	784	739
Altamont, village	669	8	2	12	8	.....	.....
Berne, town	1,915	25	17	27	33	6	13
Bethlehem, town	4,451	44	54	69	48	27	24
Coeymans, town	4,264	127	97	53	59	27	30
Cohoes, city	24,183	511	464	489	432	195	207
Colonie, town	7,845	74	99	121	128	49	49
Green Island, town .....	.....	.....	.....	.....	.....	.....	.....
Green Island, village	*4,878	68	62	64	85	30	20
Guilderland, town	2,871	23	38	36	53	10	17
Knox, town	1,174	17	11	24	17	10	10
New Scotland, town	2,536	29	37	31	35	12	14
Rensselaerville, town	1,682	25	17	27	37	7	4
Voorheesville, village	479	3	7	6	12	.....	.....
Watervliet, city	14,600	196	184	230	252	130	69
Westerlo, town	1,558	22	13	22	21	7	8
Total	171,497	2,410	2,356	2,970	3,062	†1,299	1,204

NOTE.—In giving the population of towns including incorporated villages, the town is credited with the inhabitants residing outside of the village limits, as that territory constitutes a separate registration district from the village.

* Town and village have same boundaries.

† Includes 5 delayed returns.

Allegany County

	Popula- tion	BIRTHS		DEATHS		MARRIAGES	
		1909	1908	1909	1908	1909	1908
Alfred, town	872	18	15	16	11	11	13
Alfred, village	912	9	13	8	6	.....	.....
Allen, town	631	15	17	6	6	4	2
Alma, town	1,064	15	23	6	18	4	6
Almond, town	1,429	18	18	13	16	9	7
Amity, town	1,130	22	16	20	15	15	8
Andover, town	882	20	17	10	10	23	15
Andover, village	1,097	13	19	25	15	.....	.....
Angelica, town	575	10	16	19	17	13	9
Angelica, village	1,101	25	17	22	18	.....	.....
Belfast, town	1,640	25	17	24	13	10	15
Belfast, village .....	.....	.....	13	.....	14	.....	.....
Belmont, village	1,207	20	19	17	14	.....	.....
Birdsall, town	653	8	7	8	5	3	4
Bolivar, town	938	25	26	5	5	37	19
Bolivar, village	1,368	26	29	17	15	.....	.....
Burns, town	731	17	12	13	13	12	9
Canaseraga, village	730	9	7	7	11	.....	.....
Caneadea, town	1,387	26	20	20	25	8	10
Centreville, town	1,029	11	20	11	6	3	5
Clarksville, town	838	18	18	10	9	8	8
Cuba, town	821	12	19	13	12	24	16
Cuba, village	1,519	25	36	28	40	.....	.....
Friendship, town	978	17	18	17	18	14	18
Friendship, village	1,259	13	16	19	18	.....	.....
Genesee, town	1,146	15	10	11	9	11	14
Granger, town	761	9	9	3	10	3	9
Grove, town	766	11	15	16	8	5	7
Hume, town	1,817	26	26	30	20	13	17
Independence, town	1,222	24	24	14	13	18	11
New Hudson, town	879	14	12	9	11	7	5
Richburg, village	375	7	9	5	1	.....	.....
Rushford, town	1,432	28	24	18	17	10	6
Scio, town	1,354	26	21	22	18	8	12
Ward, town	521	9	6	7	8	4	2
Wellsville, town	1,366	27	29	18	12	43	55
Wellsville, village	4,355	62	75	74	64	.....	.....
West Almond, town	548	7	9	6	11	2	3
Willing, town	1,120	21	13	17	5	1	6
Wirt, town	788	13	14	6	9	7	6
Total	43,257	716	744	610	566	330	317

Broome County

	Popula- tion	BIRTHS		DEATHS		MARRIAGES	
		1909	1908	1909	1908	1909	1908
Barker, town.....	984	17	26	17	21	6	13
Binghamton, town.....	703	10	11	12	11	0	2
Binghamton, city.....	42,036	943	885	714	737	491	458
Chenango, town.....	1,314	17	12	22	26	10	6
Colesville, town.....	2,457	36	17	46	43	18	17
Conklin, town.....	935	8	15	10	11	6	5
Deposit, village.....	2,136	24	28	27	30	.....	.....
Dickinson, town.....	277	2	7	44	45	2	2
Endicott, village.....	.....	44	45	18	17	.....	.....
Fenton, town.....	1,145	20	17	15	18	13	6
Kirkwood, town.....	887	9	11	16	12	4	5
Lestershire, village.....	4,035	72	73	48	53	.....	.....
Lisle, town.....	1,173	15	20	14	19	9	10
Lisle, village.....	378	3	2	4	7	.....	.....
Maine, town.....	1,411	18	25	22	28	12	11
Nanticoke, town.....	621	6	14	8	9	3	3
Port Dickinson, village.....	426	5	6	9	9	.....	.....
Sanford, town.....	1,288	23	24	22	17	36	25
Triangle, town.....	884	14	16	11	17	15	18
Union, town.....	2,657	19	28	27	29	76	72
Union, village.....	1,454	18	24	22	22	.....	.....
Vestal, town.....	1,681	28	18	24	32	4	13
Whitney's Point, village.....	749	8	12	13	11	.....	.....
Windsor, town.....	1,943	27	11	24	34	21	23
Windsor, village.....	691	7	4	13	12	.....	.....
Total.....	72,282	1,393	1,351	1,202	1,270	728	689

‡ Includes 2 delayed returns.

Cattaraugus County

	Popula- tion	BIRTHS		DEATHS		MARRIAGES	
		1909	1908	1909	1908	1909	1908
Allegany, town.....	2,224	49	50	25	21	30	26
Allegany, village.....	1,330	21	24	13	12	.....	.....
Ashford, town.....	1,567	31	31	19	29	14	12
Carrollton, town.....	879	1	2	7	5	42	39
Cattaraugus, village.....	1,184	15	15	18	14	.....	.....
Cold Spring, town.....	713	12	15	8	9	5	1
Coneawango, town.....	1,162	14	12	8	9	10	14
Dayton, town.....	1,754	44	29	25	29	9	13
East Otto, town.....	1,111	31	15	15	15	5	8
East Randolph, village.....	644	6	4	16	15	.....	.....
Elko, town.....	324	9	10	3	3	1	2
Ellicottville, town.....	1,071	22	17	15	12	17	8
Ellicottville, village.....	1,044	22	19	14	15	.....	.....
Farmersville, town.....	1,014	19	16	10	14	6	7
Franklinville, town.....	1,025	17	12	18	13	22	24
Franklinville, village.....	1,485	46	15	29	32	.....	.....
Freedom, town.....	1,229	14	12	12	15	5	11
Gowanda, village.....	†2,063	28	31	21	28	.....	.....
Great Valley, town.....	2,167	36	24	24	25	8	14
Hinsdale, town.....	1,152	21	21	16	25	9	9
Humphrey, town.....	680	11	8	5	8	7	8
Ischua, town.....	811	16	20	6	15	2	4

† Part of village in Erie county.

Cattaraugus County — Continued

	Popula- tion	BIRTHS		DEATHS		MARRIAGES	
		1909	1908	1909	1908	1909	1908
Leon, town.....	845	9	19	4	7	3	8
Limestone, village.....	721	16	19	10	5	.....	.....
Little Valley, town.....	497	12	8	8	4	21	15
Little Valley, village.....	1,225	24	24	17	16	.....	.....
Lyndon, town.....	647	11	9	10	10	5	9
Machias, town.....	1,494	32	28	45	27	1	.....
Mansfield, town.....	940	19	19	7	17	2	2
Napoli, town.....	791	14	14	9	12	4	3
New Albion, town.....	863	18	18	9	12	21	20
North Olean, village.....	1,761	.....	62	.....	32	.....	.....
Olean, town.....	3,380	9	78	14	47	21	64
Olean, city.....	10,163	331	246	211	139	153	129
Otto, town.....	927	11	19	13	14	6	8
Perrysburg, town.....	1,049	9	16	16	14	7	7
Persia, town.....	1,858	5	5	3	4	14	10
Portville, town.....	1,624	31	29	18	15	26	13
Portville, village.....	774	10	6	8	7	.....	.....
Randolph, town.....	539	18	14	11	7	13	18
Randolph, village.....	1,163	19	21	12	19	.....	.....
Red House, town.....	564	25	12	8	11	6	4
Salamanca, town.....	415	4	3	2	3	73	65
Salamanca, village.....	5,455	141	151	72	66	.....	.....
South Valley, town.....	562	16	17	7	5	1	4
West Salamanca, village.....	558	5	6	3	9	.....	.....
Yorkshire, town.....	1,730	20	22	31	27	7	8
Total.....	66,196	1,294	1,267	875	892	*583	587

* Includes 7 delayed returns.

Cayuga County

	Popula- tion	BIRTHS		DEATHS		MARRIAGES	
		1909	1908	1909	1908	1909	1908
Auburn, city.....	31,422	615	600	499	483	325	277
Aurelius, town.....	1,148	9	16	14	24	6	19
Aurora, village.....	.....	5	10	3	6	.....	.....
Brutus, town.....	993	15	21	5	15	19	21
Cato, town.....	1,160	15	19	14	16	13	11
Cato, village.....	357	2	4	4	5	.....	.....
Cayuga, village.....	400	6	13	9	8	.....	.....
Conquest, town.....	1,187	13	13	15	16	10	5
Fair Haven, village.....	660	14	3	10	11	.....	.....
Fleming, town.....	1,006	27	17	21	15	2	4
Genoa, town.....	1,866	15	23	23	35	0	0
Ira, town.....	1,230	23	17	19	25	7	7
Ledyard, town.....	1,996	25	11	16	13	7	12
Locke, town.....	914	6	12	16	16	9	7
Mentz, town.....	869	14	7	11	15	19	18
Meridian, village.....	314	5	2	7	.....	.....	.....
Montezuma, town.....	914	13	16	18	17	4	7
Moravia, town.....	1,234	2	7	15	12	19	17
Moravia, village.....	1,489	2	9	24	27	.....	.....
Niles, town.....	1,159	12	22	21	13	9	9
Owasco, town.....	1,302	18	13	31	23	9	2
Port Byron, village.....	1,016	15	11	23	18	.....	.....
Scipio, town.....	1,512	18	17	21	21	5	8
Sempronius, town.....	594	8	19	11	15	8	6
Sennett, town.....	1,859	19	22	31	36	2	3
Springport, town.....	446	13	11	18	7	6	5
Stirling, town.....	1,844	20	43	29	36	19	18
Sumner Hill, town.....	669	10	13	10	8	9	5
Throop, town.....	984	8	6	9	8	5	8
Union Springs, village.....	890	10	10	18	12	.....	.....
Venice, town.....	1,309	5	12	22	16	4	5
Victory, town.....	1,316	22	16	26	19	7	11
Weedsport, village.....	1,495	19	17	22	24	.....	.....
Total.....	65,309	1,023	1,043	1,038	1,016	523	486

Chautauqua County

	Popula- tion	BIRTHS		DEATHS		MARRIAGES	
		1909	1908	1909	1908	1909	1908
Arkwright, town.....	863	12	10	7	5	6	5
Brocton, village.....	1,056	27	25	16	11	.....	.....
Busti, town.....	1,534	26	38	20	16	11	14
Carroll, town.....	1,638	38	31	33	16	18	14
Celoron, village.....	700	17	20	5	7	.....	.....
Charlotte, town.....	684	21	15	6	10	9	6
Chautauqua, town.....	3,505	38	30	64	60	61	61
Chautauqua Lake Associa- tion, village.....	*	9	3	6	5	.....	.....
Cherry creek, town.....	807	13	17	12	9	16	3
Cherry creek, village.....	634	8	6	10	9	.....	.....
Clymer, town.....	1,180	22	22	10	18	10	10
Dunkirk, town.....	438	15	20	13	17	.....	2
Dunkirk, city.....	15,255	524	615	191	224	164	147
Ellery, town.....	1,638	37	29	31	23	11	8
Ellicott, town.....	1,561	24	32	23	18	30	18
Ellington, town.....	1,264	22	25	10	18	3	6
Falconer, village.....	1,643	39	22	18	20	.....	.....
Forestville, village.....	680	16	9	10	8	.....	.....
Fredonia, village.....	5,148	115	150	84	93	.....	.....
French Creek, town.....	951	11	9	15	9	3	7
Gerry, town.....	1,146	27	19	14	20	1	.....
Hanover, town.....	2,396	54	27	25	35	54	49
Harmony, town.....	2,407	36	49	34	42	17	18
Jamestown, city.....	20,160	594	617	343	313	480	381
Kiantone, town.....	524	13	13	8	4	.....	2
Lakewood, village.....	552	6	8	10	8	.....	.....
Mayville, village.....	1,021	23	21	23	10	.....	1
Mina, town.....	1,012	20	8	11	15	5	8
Panama, village.....	375	7	4	4	6	.....	.....
Poland, town.....	1,497	22	20	23	26	5	5
Pomfret, town.....	2,160	50	49	34	23	64	58
Portland, town.....	1,998	28	33	22	27	12	19
Ripley, town.....	2,257	29	43	36	25	57	42
Sheridan, town.....	1,861	19	14	28	24	3	10
Sherman, town.....	709	25	22	16	13	13	7
Sherman, village.....	797	12	13	17	12	.....	.....
Silver Creek, village.....	2,073	46	45	31	27	.....	.....
Sinclairville, village.....	507	2	5	9	13	.....	.....
Stockton, town.....	1,821	33	21	28	19	18	11
Villanova, town.....	1,054	33	22	21	19	8	12
Westfield, town.....	1,531	25	20	15	16	75	57
Westfield, village.....	2,823	69	61	55	46	.....	.....
Total.....	96,880	2,207	2,262	1,391	1,339	1,154	980

* Population included in that of the town of Chautauqua.

Chemung County

	Popula- tion	BIRTHS		DEATHS		MARRIAGES	
		1909	1908	1909	1908	1909	1908
Ashland, town.....	359	8	5	3	3	10	13
Baldwin, town.....	506	8	11	11	14	2	.....
Big Flats, town.....	1,571	26	35	31	23	13	9
Catlin, town.....	912	15	8	19	20	9	8
Chemung, town.....	1,328	23	24	19	22	10	15
Elmira, town.....	1,377	16	11	24	16	4	5
Elmira, city.....	34,678	537	609	545	544	422	336
Elmira Heights, village.....	*1,969	51	39	28	30	.....	.....
Erin, town.....	898	24	21	13	14	5	3
Horseheads.....	3,016	21	24	50	40	45	45
Horseheads, village.....	1,810	42	33	30	26	.....	.....
Southport, town.....	2,073	27	16	23	22	18	19
Van Etten, town.....	666	9	20	15	18	9	6
Van Etten, village.....	420	7	6	8	13	.....	.....
Veteran, town.....	1,475	25	24	19	25	8	8
Wellsburg, village.....	481	5	13	8	2	.....	.....
Total.....	51,600	844	899	846	832	555	467

* Part of village in town of Horseheads.

Chenango County

	Popula- tion	BIRTHS		DEATHS		MARRIAGES	
		1909	1908	1909	1908	1909	1908
Afton, town.....	1,144	4	10	24	25	12	18
Afton, village.....	707	13	8	14	17	.....	.....
Bainbridge, town.....	855	10	23	12	18	15	15
Bainbridge, village.....	1,113	12	8	13	22	.....	.....
Columbus, town.....	863	15	14	13	9	5	4
Coventry, town.....	889	12	12	14	11	6	10
German, town.....	430	12	6	6	8	5	2
Greene, town.....	1,806	23	26	29	26	12	17
Greene, village.....	1,358	20	20	31	23	.....	.....
Guilford, town.....	2,261	27	35	28	37	13	8
Lincklaen, town.....	607	10	8	9	12	7	5
McDonough, town.....	816	14	23	16	13	6	4
New Berlin, town.....	1,297	21	15	18	21	20	11
New Berlin, village.....	1,128	16	17	24	21	.....	.....
North Norwich, town.....	742	8	12	11	14	.....	.....
Norwich, town.....	1,332	23	25	24	11	76	66
Norwich, village.....	7,115	138	143	138	115	.....	.....
Otselie, town.....	1,111	16	17	14	20	12	5
Oxford, town.....	1,393	17	23	59	46	22	17
Oxford, village.....	1,865	17	33	24	32	.....	.....
Pharsalia, town.....	690	10	8	8	6	3	2
Pitcher, town.....	740	9	9	16	10	4	6
Plymouth, town.....	995	11	14	15	12	10	4
Preston, town.....	626	7	7	16	16	1	1
Sherburne, town.....	1,768	19	29	19	32	7	17
Sherburne, village.....	927	10	12	23	12	.....	.....
Smithville, town.....	994	12	12	12	13	4	5
Smyrna, town.....	922	24	12	18	19	9	6
Smyrna, village.....	271	4	2	2	2	.....	.....
Total.....	36,783	530	583	650	623	251	226

Clinton County

	Popula- tion	BIRTHS		DEATHS		MARRIAGES	
		1909	1908	1909	1908	1909	1908
Altona, town.....	2,500	45	68	33	25	15	22
Ausable, town.....	2,399	13	14	14	16	10	11
Beekmantown, town.....	1,889	18	16	32	44	21	14
Black Brook, town.....	2,129	17	12	21	14	16	14
Champlain, town.....	1,767	74	53	33	24	46	45
Champlain, village.....	1,400	44	17	11	10	.....	.....
Chazy, town.....	2,835	116	*109	37	47	24	15
Clinton, town.....	1,590	49	40	24	13	12	19
Dannemora, town.....	2,084	42	18	10	9	16	13
Dannemora, village.....	633	17	9	12	20	.....	.....
Ellenburgh, town.....	3,201	45	50	11	8	31	11
Moers, town.....	2,825	72	71	60	52	17	20
Moers, village.....	537	5	17	8	10	.....	.....
Peru, town.....	2,354	39	34	30	40	11	11
Plattsburgh, town.....	2,475	40	36	31	25	19	18
Plattsburgh, city.....	10,184	222	212	202	132	151	110
Rouse's Point, village.....	1,674	11	18	12	4	.....	.....
Saranac, town.....	3,156	84	104	38	47	16	17
Schuyler's Falls, town.....	1,642	29	41	25	32	14	9
Total.....	47,282	982	939	644	572	†420	349

* 19 delayed returns.

† Includes one delayed return.

Columbia County

	Popu- lation	BIRTHS		DEATHS		MARRIAGES	
		1909	1908	1909	1908	1909	1908
Ancram, town.....	1,212	22	15	17	17	9	1
Austerlitz.....	926	11	18	16	12	5	6
Canaan, town.....	1,266	11	5	17	28	11	17
Chatham, town.....	1,403	39	26	42	43	29	29
Chatham, village.....	2,090	30	20	35	35	.....	.....
Claverack, town.....	2,488	25	37	33	37	32	21
Clermont, town.....	768	15	15	11	10	8	2
Copake, town.....	1,346	18	15	20	24	7	9
Gallatin, town.....	751	11	12	13	10	5	2
Germantown, town.....	1,634	25	29	19	19	13	14
Ghent, town.....	2,581	15	25	43	58	10	11
Greenport, town.....	1,151	24	18	14	22	6	8
Hillsdale, town.....	1,423	13	6	12	21	7	20
Hudson, city.....	10,290	197	187	172	166	71	57
Kinderhook, town.....	1,131	15	11	17	13	21	20
Kinderhook, village.....	856	15	14	20	15	.....	.....
Livingston, town.....	1,605	24	15	18	19	13	8
New Lebanon, town.....	1,498	15	18	18	18	9	10
Philmont, village.....	1,971	34	27	35	34	.....	.....
Stockport, town.....	2,569	41	39	33	25	14	14
Stuyvesant, town.....	1,908	32	29	30	29	17	3
Taghkanic, town.....	760	18	10	11	12	1	2
Valatie, village.....	1,231	22	22	20	23	.....	.....
Total.....	42,868	672	613	666	690	288	254

Cortland County

	Popu- lation	BIRTHS		DEATHS		MARRIAGES	
		1909	1908	1909	1908	1909	1908
Cincinnatus, town.....	1,033	18	27	20	13	8	5
Cortland, city.....	11,272	230	201	163	179	96	84
Cortlandville, town.....	2,167	24	21	39	50	20	17
Cuyler, town.....	945	11	9	6	16	6	12
Freetown, town.....	539	14	15	7	11	3	3
Harford, town.....	679	9	12	7	14	1	3
Homer, town.....	1,487	17	26	12	22	33	25
Homer, village.....	2,536	38	27	47	42	.....	.....
Lapeer, town.....	442	5	4	7	4	3	1
McGrawville, village.....	879	12	10	19	17	.....	.....
Marathon, town.....	516	10	8	5	10	13	8
Marathon, village.....	1,042	12	16	11	18	.....	.....
Preble, town.....	841	9	15	10	11	5	10
Scott, town.....	708	18	15	13	13	4	3
Solon, town.....	540	14	17	8	9	3	2
Taylor, town.....	759	20	12	10	6	5	7
Truxton, town.....	1,186	11	17	4	21	5	3
Virgil, town.....	1,239	16	11	17	16	8	8
Willet, town.....	685	10	11	9	11	1	.....
Total.....	29,503	498	474	414	483	214	191

Delaware County

	Popula- tion	BIRTHS		DEATHS		MARRIAGES	
		1909	1908	1909	1908	1909	1908
Andes, town.....	1,529	22	16	24	24	17	11
Andes, village.....	340	6	6	7	7	.....	.....
Bovina, town.....	916	19	11	11	13	4	9
Colchester, town.....	3,070	68	62	38	40	23	31
Davenport, town.....	1,560	30	25	29	16	10	10
Delhi, town.....	1,127	15	20	15	23	19	31
Delhi, village.....	1,781	20	29	37	26	.....	.....
Deposit, town.....	1,895	15	17	11	14	11	7
Franklin, town.....	1,951	35	38	18	35	23	12
Franklin, village.....	493	3	5	6	10	.....	.....
Hamden, town.....	1,386	22	23	21	21	11	6
Hancock, town.....	4,320	63	†66	49	28	56	56
Hancock, village.....	1,381	37	35	15	14	.....	.....
Harpersfield, town.....	1,244	16	12	4	8	10	7
Hobart, village.....	503	12	6	10	10	.....	.....
Kortright, town.....	1,527	31	27	24	12	10	11
Margaretville, village.....	583	9	17	13	18	.....	.....
Masonville, town.....	1,120	22	14	19	11	11	6
Meredith, town.....	1,469	23	29	17	19	13	9
Middletown, town.....	3,236	64	67	48	33	26	27
Roxbury, town.....	2,206	28	21	39	37	16	16
Sidney, town.....	1,787	28	23	27	35	36	31
Sidney, village.....	2,532	38	34	41	32	.....	.....
Stamford, town.....	1,997	15	16	10	9	20	20
Stamford, village.....	*973	22	19	23	28	.....	.....
Tompkins, town.....	2,277	43	39	26	40	8	17
Walton, town.....	2,085	44	35	26	22	47	34
Walton, village.....	2,911	52	33	46	49	.....	.....
Total.....	46,788	802	745	654	634	‡375	351

* Part of village in Schoharie county. † 12 delayed returns. ‡ Includes 4 delayed returns.

Dutchess County

	Popula- tion	BIRTHS		DEATHS		MARRIAGES	
		1909	1908	1909	1908	1909	1908
Amenia, town.....	2,152	41	25	40	24	8	10
Beekman, town.....	933	10	8	13	12	6	4
Clinton, town.....	1,275	11	18	9	13	8	6
Dover, town.....	1,992	56	61	27	23	15	14
East Fishkill, town.....	2,088	49	41	31	31	.....	.....
Fishkill, town.....	3,081	48	67	39	37	95	74
Fishkill, village.....	579	9	8	12	9	.....	.....
Fishkill Landing, village.....	3,939	93	86	62	64	.....	.....
Hyde Park, town.....	2,944	37	46	40	40	11	1
La Grange.....	1,271	20	36	21	18	3	4
Matteawan, village.....	5,584	115	105	98	111	.....	.....
Millan, town.....	926	15	9	11	9	2	5
Millbrook, village.....	1,121	31	27	10	6	.....	.....
Millerton, village.....	775	9	11	9	21	.....	.....
North East, town.....	1,288	26	30	18	17	31	31
Pawling, town.....	1,107	16	16	21	19	11	6
Pawling, village.....	1,733	15	13	12	13	.....	.....
Pine Plains, town.....	1,315	33	26	16	22	5	7
Pleasant Valley, town.....	997	19	16	14	20	4	9
Pleasant Valley, village.....	429	14	3	7	13	.....	.....
Poughkeepsie, town.....	5,380	52	68	63	65	26	23
Poughkeepsie, city.....	25,379	542	595	503	483	212	220
Red Hook, town.....	1,261	28	15	30	24	24	22
Red Hook, village.....	1,572	21	13	15	17	.....	.....
Rhinebeck, town.....	2,063	40	19	28	30	11	19
Rhinebeck, village.....	1,547	24	33	24	24	.....	.....
Stanford, town.....	1,641	32	21	19	25	7	7
Tivoli, village.....	1,041	13	19	14	24	.....	.....
Union Vale, town.....	976	17	10	16	18	7	5
Wappinger, town.....	752	21	23	13	22	28	29
Wappingers Falls, village.....	3,588	92	*79	67	58	.....	.....
Washington, town.....	1,892	39	33	49	57	15	29
Total.....	81,633	1,588	1,580	1,351	1,369	†542	525

* 18 delayed returns. † Includes 13 delayed returns.

Eric County

	Popu- lation	BIRTHS		DEATHS		MARRIAGES	
		1909	1908	1909	1908	1909	1908
Akron, village.....	1,720	27	29	23	25	.....	.....
Alden, town.....	1,742	35	41	25	19	20	14
Alden, village.....	711	12	22	15	12	.....	.....
Amherst, town.....	3,526	57	58	36	43	.....	28
Angola, village.....	806	19	17	11	16	.....	.....
Aurora, town.....	1,732	39	37	25	14	26	31
Blasdell, village.....	702	23	20	11	5	.....	.....
Boston, town.....	1,627	28	28	32	23	9	8
Brant, town.....	1,482	42	26	29	21	20	13
Buffalo, city.....	376,587	9,027	9,171	6,111	6,052	3,542	3,203
Cheektowaga, town.....	5,425	63	43	95	79	42	33
Clarence, town.....	2,817	62	56	34	42	21	12
Colden, town.....	1,307	26	34	21	16	11	6
Collins, town.....	*2,602	43	33	31	34	16	22
Concord, town.....	2,222	42	51	25	27	33	28
Depew, village.....	3,535	144	164	57	55	.....	.....
East Aurora, village.....	2,448	51	30	37	26	.....	.....
East Hamburg, town.....	2,575	35	51	33	17	13	5
Eden, town.....	2,495	38	39	30	34	10	18
Elma, town.....	2,155	30	37	24	21	8	14
Evans, town.....	2,061	27	34	22	21	20	24
Farnham, village.....	516	12	16	7	7	.....	.....
Grand Island, town.....	972	14	18	6	8	6	7
Hamburg, town.....	3,210	63	55	48	56	49	33
Hamburg, village.....	1,967	29	30	26	26	.....	.....
Holland, town.....	1,451	17	19	17	20	7	8
Kenmore, village.....	506	5	1	4	1	.....	.....
Lackawanna, city.....	.....	170	.....	151	.....	19	.....
Lancaster, town.....	1,570	45	59	16	25	78	67
Lancaster, village.....	3,853	86	118	40	58	.....	.....
Marilla, town.....	1,513	22	27	19	23	9	5
Newstead, town.....	2,052	20	24	21	20	19	22
North Collins, town.....	2,514	52	59	29	22	16	14
Sardinia, town.....	1,843	32	17	25	19	11	14
Sloan, village.....	1,246	22	21	8	8	.....	.....
Springville, village.....	2,230	35	36	31	33	.....	.....
Tonawanda, town.....	1,005	5	16	22	16	28	38
Tonawanda, city.....	7,904	182	152	106	104	49	51
Wales, town.....	1,207	14	13	12	9	8	2
West Seneca, town.....	14,925	228	435	184	288	88	91
Williamsville, village.....	967	15	21	11	21	.....	.....
Total.....	473,700	10,947	11,158	7,510	7,366	4,186	3,811

* Including population of village of Gowanda in Cattaraugus county.

† Includes 8 delayed returns.

Essex County

	Popu- lation	BIRTHS		DEATHS		MARRIAGES	
		1909	1908	1909	1908	1909	1908
Bloomington, village.....	.....	4	5	6	5	.....	.....
Chesterfield, town.....	*2,117	20	27	25	17	19	14
Crown Point, town.....	1,800	7	28	28	31	15	10
Elizabethtown, town.....	678	11	13	11	12	9	6
Elizabethtown, village.....	519	7	14	7	3	.....	.....
Essex, town.....	1,344	22	15	35	29	11	9
Jay, town.....	1,985	42	33	44	24	16	16
Keene, town.....	1,328	25	26	17	9	4	8
Keeseville.....	†1,955	38	41	29	26	.....	.....
Lake Placid, village.....	1,514	53	31	34	27	.....	.....
Lewis, town.....	1,040	12	11	25	11	7	5
Minerva, town.....	1,012	17	14	13	20	9	.....
Moriah, town.....	3,644	110	135	52	84	68	47
Newcomb, town.....	554	2	6	3	3	2	3
North Elba, town.....	1,487	12	14	19	13	29	21
North Hudson, town.....	505	4	1	3	8	9	2
Port Henry, village.....	2,073	42	69	43	39	.....	.....
St. Armand, town.....	879	2	3	8	6	4	5

* Including population of village of Keeseville, in Essex county.

† Part of village in Clinton county.

Essex County — Continued

	Popula- tion	BIRTHS		DEATHS		MARRIAGES	
		1909	1908	1909	1908	1909	1908
Schroon, town.....	1,213	12	16	15	32	7	11
Ticonderoga, town.....	2,942	75	73	56	50	35	35
Ticonderoga, village.....	1,749	35	45	19	14	.....	.....
Westport, town.....	1,763	34	40	24	34	.....	14
Willsboro, town.....	1,629	29	27	19	19	7	5
Wilmington, town.....	574	21	11	9	8	4	3
Total.....	32,452	645	697	544	524	255	216

Franklin County

	Popula- tion	BIRTHS		DEATHS		MARRIAGES	
		1909	1908	1909	1908	1909	1908
Altamont, town.....	2,074	45	27	28	19	35	33
Bangor, town.....	2,184	53	38	20	38	18	15
Belmont, town.....	2,403	68	35	25	21	16	12
Bombay, town.....	1,386	35	27	60	15	9	8
Brandon, town.....	920	26	20	16	18	7	7
Brighton, town.....	794	16	15	17	17	4	1
Burke, town.....	1,875	39	43	23	28	14	9
Chateaugay, town.....	1,587	40	26	17	17	19	17
Chateaugay, village.....	1,064	50	16	23	19	.....	.....
Constable, town.....	1,355	31	30	30	24	8	13
Dickinson, town.....	1,762	45	51	28	24	12	12
Duane, town.....	372	10	10	1	3	.....	5
Fort Covington, town.....	1,226	29	44	22	16	19	8
Fort Covington, village.....	854	26	21	20	17	.....	.....
Franklin, town.....	1,496	24	14	23	15	9	8
Harrietstown, town.....	*4,113	9	8	11	10	52	25
Malone, town.....	4,248	89	66	69	50	103	84
Malone, village.....	6,478	122	134	101	104	.....	.....
Moira, town.....	2,477	49	56	37	36	14	12
Santa Clara, town.....	1,053	9	19	4	5	3	3
Saranac Lake, village.....	†3,834	94	†99	143	140	.....	.....
Tupper Lake, village.....	2,769	65	47	50	54	.....	.....
Waverly, town.....	2,160	61	73	35	30	21	15
Westville, town.....	1,149	20	20	22	14	8	12
Total.....	47,012	1,055	939	825	734	371	299

* Includes population of village of Saranac Lake in Franklin county.

† Part of village in Essex county.

‡ Including nonresident deaths.

Fulton County

	Popula- tion	BIRTHS		DEATHS		MARRIAGES	
		1909	1908	1909	1908	1909	1908
Bleecker, town.....	527	10	6	8	6	3	2
Broadalbin, town.....	1,933	32	30	25	27	11	12
Caroga, town.....	449	8	12	9	6	2	.....
Ephratah, town.....	1,479	33	35	28	27	6	12
Gloversville, city.....	18,672	388	344	300	341	214	164
Johnstown, town.....	2,493	34	28	55	36	14	6
Johnstown, city.....	9,845	161	172	150	123	94	76
Mayfield, town.....	1,526	21	28	26	21	15	9
Mayfield, village.....	603	9	5	11	7	.....	.....
Northampton, town.....	1,131	15	17	15	21	6	11
Northville, village.....	1,073	19	23	19	17	.....	.....
Oppenheim, town.....	1,258	9	13	15	9	7	8
Perth, town.....	676	5	8	4	7	4	3
Stratford, town.....	652	18	15	6	6	6	6
Total.....	42,330	762	736	671	654	382	309

Genesee County

	Popula- tion	BIRTHS		DEATHS		MARRIAGES	
		1909	1908	1909	1908	1909	1908
Alabama, town.....	1,644	37	29	26	15	18	8
Alexander, town.....	1,210	19	15	13	13	12	15
Alexander, village.....	207	3	2	7	3	.....	.....
Batavia, town.....	2,301	16	23	20	17	105	118
Batavia, village.....	10,080	227	187	179	182	.....	.....
Bergen, town.....	1,013	16	20	11	18	10	17
Bergen, village.....	601	14	11	6	8	.....	.....
Bethany, town.....	1,259	18	17	29	24	13	7
Byron, town.....	1,505	28	26	18	15	3	10
Corfu, village.....	481	10	5	17	5	.....	.....
Darien, town.....	1,850	26	32	31	23	16	17
Elba, town.....	1,140	13	15	15	18	10	9
Elba, village.....	404	4	1	6	4	.....	.....
Le Roy, town.....	1,712	45	34	18	23	47	35
Le Roy, village.....	3,395	93	78	59	46	.....	.....
Oakfield, town.....	929	17	25	8	12	15	9
Oakfield, village.....	873	29	29	17	19	.....	.....
Pavilion, town.....	1,546	30	12	27	20	5	11
Pembroke, town.....	1,968	29	27	23	20	12	11
Stafford, town.....	1,319	18	12	9	14	5	11
Total.....	35,878	692	600	539	499	271	272

Greene County

	Popula- tion	BIRTHS		DEATHS		MARRIAGES	
		1909	1908	1909	1908	1909	1908
Ashland, town.....	647	11	13	9	12	5	4
Athens, town.....	801	9	5	6	15	18	21
Athens, village.....	2,015	29	18	31	32	.....	.....
Cairo, town.....	1,960	33	33	71	47	14	15
Catskill, town.....	3,569	63	66	75	50	68	59
Catskill, village.....	5,294	85	105	71	81	.....	.....
Coxsackie, town.....	1,377	30	31	19	28	33	13
Coxsackie, village.....	2,940	60	72	45	46	.....	.....
Durham, town.....	1,616	16	20	28	31	14	8
Greenville, town.....	1,626	23	23	29	31	13	18
Halcott, town.....	363	6	3	7	6	1	.....
Hunter, town.....	1,418	38	49	21	25	17	20
Hunter, village.....	524	12	6	9	7	.....	.....
Jewett, town.....	1,044	9	7	7	11	8	7
Lexington, town.....	1,067	20	18	16	13	6	6
New Baltimore, town.....	2,087	27	28	31	30	15	15
Prattsville, town.....	761	17	13	10	14	8	6
Tannersville, village.....	589	18	16	10	15	.....	.....
Windham, town.....	1,427	23	33	25	28	11	12
Total.....	31,130	527	559	520	522	*247	204

* Includes 16 delayed returns.

Hamilton County

	Popula- tion	BIRTHS		DEATHS		MARRIAGES	
		1909	1908	1909	1908	1909	1908
Arietta, town	295	3	3	1	3	.....	.....
Benson, town	215	3	2	3	5	.....	.....
Hope, town	317	2	2	4	4	1	1
Indian Lake, town	1,049	23	31	7	8	14	12
Inlet, town	168	1	2	2	4	.....	.....
Lake Pleasant, town	494	.....	3	4	3	1	4
Long Lake, town	1,233	21	8	9	5	7	8
Morehouse, town	216	4	1	2	1	.....	.....
Wells, town	925	12	3	9	10	9	9
Total	4,912	69	55	41	43	34	34

Herkimer County

	Popula- tion	BIRTHS		DEATHS		MARRIAGES	
		1909	1908	1909	1908	1909	1908
Cold Brook, village	318	4	2	5	4	.....	.....
Columbia, town	1,180	6	13	17	13	6	4
Danube, town	934	19	21	9	11	5	8
Dolgeville, village	* 2,245	50	50	24	24	.....	.....
Fairfield, town	753	16	13	10	12	7	7
Frankfort, town	1,747	7	13	32	29	34	19
Frankfort, village	2,870	120	111	44	57	.....	.....
German Flats, town	1,521	17	16	24	25	83	60
Herkimer, town	1,227	21	13	41	30	87	80
Herkimer, village	6,596	162	175	115	111	.....	.....
Ilion, village	5,924	120	78	67	58	.....	.....
Litchfield, town	881	10	11	5	20	1	2
Little Falls, town	685	9	4	4	3	3	2
Little Falls, city	11,122	323	229	185	138	186	124
Manheim, town	† 2,887	7	5	6	1	28	25
Middleville, village	597	16	8	7	4	.....	.....
Mohawk, village	2,044	43	27	35	32	.....	.....
Newport, town	1,018	6	16	2	7	11	7
Newport, village	672	2	2	11	16	.....	.....
Norway, town	682	9	11	6	7	3	3
Ohio, town	704	7	10	12	7	6	2
Old Forge, village	500	12	14	10	6	.....	.....
Poland, village	366	1	1	7	8	.....	.....
Russia, town	1,372	20	24	13	28	5	9
Salisbury, town	1,373	26	21	25	15	14	10
Schuyler, town	1,192	17	11	20	20	5	4
Stark, town	999	14	18	5	14	6	4
Warren, town	1,152	18	23	18	21	4	3
Webb, town	1,255	20	23	5	16	6	9
West Winfield, village	749	3	11	9	9	.....	.....
Wilmurt, town	309	2	9	1	6	2	1
Winfield, town	711	22	14	6	10	8	8
Total	53,856	1,129	991	780	762	510	391

* Part of village in Fulton county.

† Including population of village of Dolgeville in Herkimer county.

Jefferson County

	Popula- tion	BIRTHS		DEATHS		MARRIAGES	
		1909	1908	1909	1908	1909	1908
Adams, town.....	1,728	27	32	23	19	21	16
Adams, village.....	1,449	16	19	14	21	.....	.....
Alexandria, town.....	2,407	46	46	31	32	34	41
Alexandria Bay, village.....	1,854	48	32	29	29	.....	.....
Antwerp, town.....	1,918	41	32	25	26	26	17
Antwerp, village.....	1,014	16	21	14	14	.....	.....
Belleville, village.....	346	7	3	4	4	.....	.....
Black River, village.....	969	20	22	18	13	.....	.....
Brownville, town.....	1,426	15	15	20	19	16	19
Brownville, village.....	865	20	6	5	10	.....	.....
Cape Vincent, town.....	1,566	28	17	19	17	19	14
Cape Vincent, village.....	1,231	25	17	23	11	.....	.....
Carthage, village.....	3,404	35	67	39	54	.....	.....
Champion, town.....	1,291	13	2	14	20	10	19
Chaumont, village.....	691	8	3	17	4	.....	.....
Clayton, town.....	2,177	37	43	25	38	35	33
Clayton, village.....	1,918	44	42	33	21	.....	.....
Dexter, village.....	1,031	28	18	14	15	.....	.....
Ellisburg, town.....	2,734	39	52	54	33	24	24
Ellisburg, village.....	310	4	5	6	3	.....	.....
Glen Park, village.....	582	18	10	4	3	.....	.....
Henderson, town.....	1,173	18	26	18	18	5	6
Henderson, village.....	344	4	7	.....	10	.....	.....
Hounsfield, town.....	1,443	22	24	18	19	31	18
Le Ray, town.....	2,684	31	29	32	37	10	12
Lorraine, town.....	949	17	22	8	9	9	4
Lyme, town.....	1,407	31	10	12	9	14	9
Mannsville, village.....	350	4	1	12	10	.....	.....
Orleans, town.....	2,433	45	52	32	28	16	15
Pamella, town.....	898	8	15	27	30	7	3
Philadelphia, town.....	843	18	11	10	8	12	10
Philadelphia, village.....	856	17	16	11	18	.....	.....
Rodman, town.....	1,144	34	25	17	17	8	8
Rutland, town.....	914	9	10	17	17	11	13
Sacketta Harbor, village.....	903	20	11	13	10	.....	.....
Theresa, town.....	1,130	25	32	6	17	12	17
Theresa, village.....	892	8	11	22	11	.....	.....
Watertown, town.....	1,128	14	9	18	13	3	3
Watertown, city.....	25,447	519	551	425	406	239	206
West Carthage, village.....	1,377	11	16	17	30	.....	.....
Wilna, town.....	2,462	42	31	30	31	63	59
Worth, town.....	728	8	13	5	6	3	5
Total.....	80,459	1,440	1,426	1,181	1,160	628	571

Lewis County

	Popula- tion	BIRTHS		DEATHS		MARRIAGES	
		1909	1908	1909	1908	1909	1908
Constableville, village.....	447	8	6	3	11	.....	.....
Copenhagen, village.....	612	9	3	15	17	.....	.....
Croghan, town.....	2,983	42	45	20	17	19	12
Croghan, village.....	.....	23	8	6	7	.....	.....
Denmark, town.....	1,467	17	13	16	21	8	8
Diana, town.....	1,555	23	15	24	14	22	11
Greig, town.....	911	16	25	15	24	7	5
Harrisburg, town.....	731	10	8	5	15	5	.....
Harrisville, village.....	780	20	27	9	15	.....	.....
Highmarket, town.....	589	8	11	8	5	1	1
Lewis, town.....	861	15	17	11	10	7	1
Leyden, town.....	925	21	24	23	10	9	7
Lowville, town.....	1,402	20	16	25	31	29	29
Lowville, village.....	2,519	28	33	45	61	.....	.....

Lewis County — Continued

	Popula- tion	BIRTHS		DEATHS		MARRIAGES	
		1909	1908	1909	1908	1909	1908
Lyonsdale, town.....	1,082	19	24	11	17	8	8
Lyons Falls, village.....	709	29	22	12	12	.....	.....
Martinsburgh, town.....	1,749	28	35	23	27	17	13
Montague, town.....	616	9	8	8	4	4	9
New Bremen, town.....	1,764	28	25	18	14	12	6
Osceola, town.....	513	8	7	4	.....	2	.....
Pinckney, town.....	846	13	10	11	8	8	9
Port Leyden, village.....	717	10	12	13	8	.....	.....
Turin, town.....	745	7	15	11	8	6	5
Turin, village.....	389	2	2	7	7	.....	.....
Watson, town.....	890	9	6	13	15	13	7
West Turin, town.....	807	16	13	15	13	16	17
Total.....	26,643	438	430	371	391	*194	151

* Includes 1 delayed return.

Livingston County

	Popula- tion	BIRTHS		DEATHS		MARRIAGES	
		1909	1908	1909	1908	1909	1908
Avon, town.....	1,356	17	11	16	15	17	29
Avon, village.....	1,782	41	57	28	32	.....	.....
Caledonia, town.....	1,009	13	17	8	7	13	13
Caledonia, village.....	1,221	27	18	21	15	.....	.....
Conesus, town.....	1,069	12	16	18	13	3	5
Dansville, village.....	3,908	62	57	46	64	.....	.....
Geneseo, town.....	1,093	18	20	20	20	27	24
Geneseo, village.....	2,245	34	35	30	31	.....	.....
Groveland, town.....	1,462	32	23	10	13	9	6
Leicester, town.....	1,414	32	36	18	25	12	1
Lima, town.....	1,290	13	21	12	16	6	11
Lima, village.....	972	12	20	14	10	.....	.....
Livonia, town.....	1,962	38	54	26	36	14	17
Livonia, village.....	782	7	15	11	7	.....	.....
Moscow, village.....	.....	6	.....	3	.....	.....	.....
Mount Morris, town.....	1,337	29	32	19	9	43	46
Mount Morris, village.....	2,611	44	36	50	30	.....	.....
North Dansville, town.....	374	6	8	14	1	47	28
Nunda, town.....	1,274	29	31	23	24	12	9
Nunda, village.....	1,000	14	18	19	17	.....	.....
Ossian, town.....	802	15	10	7	9	2	2
Portage, town.....	1,002	18	18	17	16	8	6
Sparta, town.....	1,015	10	10	6	13	7	5
Springwater, town.....	1,861	42	16	21	26	.....	.....
West Sparta, town.....	807	21	9	5	5	3	5
York, town.....	2,790	7	51	31	44	19	14
Total.....	36,450	599	639	493	498	242	225

Madison County

	Popu- lation	BIRTHS		DEATHS		MARRIAGES	
		1909	1908	1909	1908	1909	1908
Brookfield, town.....	2,003	34	31	31	45	20	19
Brookfield, village.....	1,434	6	3	9	9	.....	.....
Canastota, village.....	3,244	80	77	47	44	.....	.....
Cazenovia, town.....	1,801	25	24	32	26	34	24
Cazenovia, village.....	1,756	20	28	33	33	.....	.....
Chittenango, village.....	639	10	17	8	8	.....	.....
De Ruyter, town.....	704	9	6	13	8	8	9
De Ruyter, village.....	597	.....	2	5	3	.....	.....
Earlville, village.....	*785	20	20	19	12	.....	.....
Eaton, town.....	1,909	21	25	53	45	16	18
Fenner, town.....	822	15	18	6	16	6	4
Georgetown, town.....	896	23	20	11	15	12	4
Hamilton, town.....	12,092	11	19	37	23	38	16
Hamilton, village.....	1,522	23	15	29	32	.....	.....
Lebanon, town.....	1,099	18	24	4	24	10	7
Lenox, town.....	1,765	36	24	22	19	4	49
Lincoln, town.....	1,000	23	22	14	19	3	4
Madison, town.....	1,664	30	33	20	32	11	9
Madison, village.....	313	4	2	3	6	.....	.....
Morrisville, village.....	565	7	8	11	14	.....	.....
Nelson, town.....	1,136	17	21	8	22	4	12
Oneida, city.....	8,420	138	137	139	135	72	66
Smithfield, town.....	1,829	16	14	14	13	10	6
Stockbridge, town.....	1,576	17	26	23	20	14	10
Sullivan, town.....	2,894	46	46	33	48	16	17
Wampsville, village.....	.....	1	2	4	1	.....	.....
Total.....	39,690	650	664	628	672	318	274

*Part of village in Chenango County.

† Including population of village of Earlville in Madison county, but not village of Hamilton

Monroe County

	Popu- lation	BIRTHS		DEATHS		MARRIAGES	
		1909	1908	1909*	1908	1909	1908
Brighton, town.....	3,125	58	46	48	39	29	25
Brockport, village.....	3,627	55	48	57	64	.....	.....
Charlotte, village.....	1,834	17	27	31	32	.....	.....
Chili, town.....	2,024	35	28	25	30	12	7
Churchville, village.....	645	18	14	7	3	.....	.....
Clarkson, town.....	1,567	29	21	15	27	8	9
East Rochester, village.....	.....	38	43	19	19	.....	.....
Fairport, village.....	2,598	47	42	45	37	.....	.....
Gates, town.....	3,739	86	65	47	48	29	20
Greece, town.....	4,408	55	61	101	123	44	47
Hamlin, town.....	2,171	44	53	18	28	22	18
Henrietta, town.....	1,959	19	34	24	21	5	8
Hilton, village.....	568	15	11	14	9	.....	.....
Honeoye Falls, village.....	1,208	14	13	19	13	.....	.....
Irondequoit, town.....	3,160	66	73	46	30	18	24
Mendon, town.....	1,724	17	30	20	19	15	20
Ogden, town.....	1,858	40	44	28	18	17	12
Parma, town.....	2,237	35	46	28	28	17	22
Penfield, town.....	3,139	57	62	40	38	18	17
Perinton, town.....	2,758	28	29	31	28	53	37
Pittsford, town.....	1,625	20	21	14	25	25	22
Pittsford, village.....	1,056	20	14	19	18	.....	.....
Riga, town.....	1,362	30	26	19	16	14	16
Rochester, city.....	181,666	4,387	4,488	2,948	2,706	1,912	1,669
Rush, town.....	1,415	10	4	17	12	1	9
Spencerport, village.....	753	10	6	11	7	.....	.....
Sweden, town.....	1,289	18	19	15	14	27	23
Webster, town.....	3,570	56	50	36	30	25	25
Webster, village.....	850	17	13	16	15	.....	.....
Wheatland, town.....	2,321	47	53	26	32	16	10
Total.....	239,434	5,378	5,484	3,784	3,529	*2,325	2,040

*Includes 18 delayed returns.

Montgomery County

	Popula- tion	BIRTHS		DEATHS		MARRIAGES	
		1909	1908	1909	1908	1909	1908
Amsterdam, town.....	1,850	33	25	32	23	24	21
Amsterdam, city.....	23,943	749	470	426	414	355	359
Canajoharie, town.....	1,758	18	23	30	33	27	29
Canajoharie, village.....	2,224	29	29	30	28	.....	.....
Charlestown, town.....	932	9	14	9	16	4	8
Florida, town.....	2,012	27	14	23	17	9	7
Fonda, village.....	1,131	33	30	22	24	.....	.....
Fort Plain, village.....	2,596	48	28	38	37	.....	.....
Fultonville, village.....	912	17	6	12	16	.....	.....
Glen, town.....	1,279	6	4	19	12	14	18
Hagaman, village.....	815	15	18	4	7	.....	.....
Minden, town.....	1,995	26	12	25	32	33	37
Mohawk, town.....	1,476	19	21	21	18	21	13
Nelliston, village.....	709	7	6	5	15	.....	.....
Palatine, town.....	1,381	22	23	33	40	25	15
Palatine Bridge, village.....	318	2	6	5	6	.....	.....
Root, town.....	1,607	18	16	19	19	13	3
St. Johnsville, town.....	801	9	10	11	11	35	22
St. Johnsville, village.....	2,172	64	46	34	51	.....	.....
Total.....	49,928	1,157	801	798	819	560	532

Nassau County

	Popula- tion	BIRTHS		DEATHS		MARRIAGES	
		1909	1908	1909	1908	1909	1908
East Rockaway, village.....	877	7	7	6	1	.....	.....
Farmingdale, village.....	1,234	28	16	10	14	.....	.....
Floral Park, village.....	.....	11	1	5	1	.....	.....
Freeport, village.....	4,012	64	40	76	45	.....	.....
Hempstead, town.....	21,564	568	526	338	362	272	221
Hempstead, village.....	4,145	83	80	69	55	.....	.....
Lawrence, village.....	1,500	10	3	9	4	.....	.....
Mineola, village.....	.....	64	33	98	98	.....	.....
North Hempstead, town.....	14,163	355	*352	198	164	154	133
Oyster Bay, town.....	17,561	463	293	254	257	132	118
Rockville Center, village.....	2,648	50	42	48	40	.....	.....
Sea Cliff, village.....	1,750	28	23	20	22	.....	.....
Total.....	69,477	1,731	1,416	1,131	1,063	558	472

* 18 delayed.

New York (Greater)

	Popula- tion	BIRTHS		DEATHS		MARRIAGES	
		1909	1908	1909	1908	1909	1908
City of New York:							
Borough of Manhattan...	2,174,335	62,990	66,818	37,961	37,726	*31,596	*29,550
Borough of the Bronx....	290,097	9,574	9,605	6,426	6,338	.....	.....
Borough of Brooklyn....	1,404,569	41,494	41,906	24,365	23,938	12,714	11,664
Borough of Queens.....	209,685	6,317	6,421	3,838	3,579	1,647	1,647
Borough of Richmond....	74,174	1,992	2,055	1,515	1,494	450	426
Total.....	4,244,411	122,367	126,805	74,105	73,075	46,407	432,87

* Includes marriages of Borough of Bronx.

Niagara County

	Popula- tion	BIRTHS		DEATHS		MARRIAGES	
		1909	1908	1909	1908	1909	1908
Barker, village	.....	8	10	2	4	.....	.....
Cambris, town	1,782	44	29	21	9	13	10
Hartland, town	2,652	57	53	36	36	18	22
La Salle, village	1,023	19	22	15	16	.....	.....
Lewiston, town	2,317	51	48	33	31	23	18
Lewiston, village	716	13	10	15	11	.....	.....
Lockport, town	2,371	37	33	70	50	.....	12
Lockport, city	17,552	374	320	276	257	155	116
Middleport, village	1,358	26	18	20	23	.....	.....
Newfane, town	3,707	80	89	43	45	26	29
Niagara, town	339	.....	1	.....	.....	13	12
Niagara Falls, city	26,560	646	553	465	452	356	321
North Tonawanda	10,157	327	279	163	152	114	90
Pendleton, town	1,263	16	17	16	19	14	7
Porter, town	1,632	42	40	21	25	13	20
Royalton, town	3,339	76	54	52	45	35	41
Somerset, town	2,069	36	35	23	26	11	19
Wheatfield, town	1,855	35	32	22	22	20	13
Wilson, town	2,342	30	36	25	28	16	20
Wilson, village	651	8	11	11	7	.....	.....
Youngstown, village	570	12	9	6	7	.....	.....
Total	84,744	1,937	1,699	1,335	1,265	827	750

Oneida County

	Popula- tion	BIRTHS		DEATHS		MARRIAGES	
		1909	1908	1909	1908	1909	1908
Annsville, town	1,621	18	23	33	17	11	7
Augusta, town	1,219	16	19	18	19	19	7
Ava, town	600	11	6	9	4	4	1
Boonville, town	1,433	26	19	23	25	24	28
Boonville, village	1,734	26	24	24	36	.....	.....
Bridgewater, town	700	4	10	5	14	3	6
Bridgewater, village	261	3	2	3	3	.....	.....
Camden, town	1,330	30	23	20	27	20	19
Camden, village	2,420	32	33	38	35	.....	.....
Clayville, village	357	12	11	8	13	.....	.....
Clinton, village	1,315	11	7	14	24	.....	.....
Deerfield, town	1,615	28	23	21	32	9	15
Florence, town	1,086	14	16	21	22	7	6
Floyd, town	739	7	9	13	9	4	2
Forestport, town	768	14	12	16	.....	3	8
Forestport, village	689	8	8	9	14	.....	.....
Holland Patent, village	320	6	8	8	6	.....	.....
Kirkland, town	3,228	51	38	48	38	24	33
Lee, town	1,485	25	14	19	21	8	6
Marcy, town	1,385	14	19	24	20	5	8
Marshall, town	1,762	30	24	16	13	4	9
New Hartford, town	4,420	109	110	53	71	41	47
New Hartford, village	1,043	24	26	17	24	.....	.....
Oneida Castle, village	357	4	2	2	3	.....	.....
Oriskany Falls, village	813	12	12	15	15	.....	.....
Paris, town	2,073	42	38	28	23	26	20
Prospect, village	330	8	2	3	2	.....	.....
Remsen, town	660	16	11	9	8	6	5
Remsen, village	399	5	5	3	8	.....	.....
Rome, city	16,562	481	426	397	359	154	153
Sangerfield, town	736	22	17	12	10	16	19
Steuben, town	788	14	12	8	14	3	2
Sylvan Beach, village	.....	2	1	3	8	.....	.....
Trenton, town	1,595	32	25	18	21	9	10
Trenton, village	317	8	9	4	7	.....	.....
Utica, city	62,934	1,816	1,747	1,153	1,297	698	632
Vernon, town	2,285	39	32	23	38	21	14

* Included in town of Vienna.

Oneida County — (Continued)

	Popula- tion	BIRTHS		DEATHS		MARRIAGES	
		1909	1908	1909	1908	1909	1908
Vernon, village.....	430	7	8	5	3	.....	.....
Verona, town.....	3,636	59	50	54	43	21	24
Vienna, town.....	1,958	19	20	21	28	14	13
Waterville, village.....	1,510	23	21	20	29	.....	.....
Western, town.....	1,442	23	24	24	20	13	2
Westmoreland, town.....	2,067	24	30	30	24	13	12
Whitesboro, village.....	2,018	34	32	30	24	.....	.....
Whitestown, town.....	4,353	122	139	79	77	91	77
Yorkville, village.....	524	8	10	6	9	.....	.....
Total.....	139,341	3,339	3,157	2,408	2,557	*1,281	1,185

* Includes one delayed return.

Onondaga County

	Popula- tion	BIRTHS		DEATHS		MARRIAGES	
		1909	1908	1909	1908	1909	1908
Baldwinsville, village.....	2,961	33	36	35	49	.....	.....
Camillus, town.....	1,880	38	44	31	32	11	26
Camillus, village.....	706	19	21	15	7	.....	.....
Cicero, town.....	2,451	49	46	35	33	15	19
Clay, town.....	2,410	34	42	40	34	11	10
De Witt, town.....	2,718	31	33	41	45	37	37
East Syracuse, village.....	2,996	70	77	38	25	.....	.....
Eastwood, village.....	538	9	15	3	7	.....	.....
Elbridge, town.....	1,507	24	21	26	25	13	17
Elbridge, village.....	569	7	9	5	7	.....	.....
Fabius, town.....	1,199	23	19	19	14	9	9
Fabius, village.....	346	4	2	6	7	.....	.....
Fayetteville, village.....	1,380	25	22	29	31	.....	.....
Geddes, town.....	794	15	5	16	7	44	40
Jordan, village.....	965	5	6	12	19	.....	.....
La Fayette, town.....	1,489	13	22	22	30	9	5
Liverpool, village.....	1,144	26	21	21	9	.....	.....
Lysander, town.....	1,418	30	27	46	40	30	32
Manlius, town.....	3,205	58	62	54	37	41	28
Manlius, village.....	1,236	26	27	22	30	.....	.....
Marcellus, town.....	2,073	32	22	31	18	14	10
Marcellus, village.....	671	10	17	5	10	.....	.....
Onondaga, town.....	5,324	74	68	167	176	37	34
Otisco, town.....	1,131	28	17	18	14	1	6
Pompey, town.....	2,381	39	28	42	45	18	10
Salina, town.....	2,682	27	20	15	17	20	15
Skaneateles, town.....	2,677	56	56	42	37	25	39
Skaneateles, village.....	1,584	29	23	21	19	.....	.....
Solvay, village.....	4,196	83	94	63	89	.....	.....
Spafford, town.....	1,130	23	26	20	13	4	3
Syracuse, city.....	117,503	2,654	2,261	1,949	2,036	1,036	938
Tully, town.....	863	23	17	14	17	11	8
Tully, village.....	600	5	6	11	10	.....	.....
Van Buren, town.....	3,147	29	22	29	24	19	18
Total.....	178,441	3,651	3,234	2,943	3,013	*1,408	1,296

* Includes 3 delayed returns.

Ontario County

	Popula- tion	BIRTHS		DEATHS		MARRIAGES	
		1909	1908	1909	1908	1909	1908
Bristol, town.....	1,268	21	18	19	12	3	5
Canadice, town.....	577	3	9	11	2	2	.....
Canandaigua, town.....	2,236	25	29	32	28	92	56
Canandaigua, village.....	7,332	117	106	131	125	.....	.....
Clifton Springs, village.....	1,586	26	20	37	40	.....	.....
East Bloomfield, town.....	1,979	50	23	20	21	18	16
Farmington, town.....	1,611	21	28	17	12	10	7
Geneva, town.....	1,080	16	16	13	6	1	5
Geneva, city.....	12,249	255	240	183	152	108	93
Gorham, town.....	2,222	30	31	23	22	15	11
Hopewell, town.....	1,470	21	17	19	30	7	5
Manchester, town.....	1,482	28	20	25	23	28	24
Manchester, village.....	784	20	29	9	13	.....	.....
Naples, town.....	1,252	19	11	14	10	11	12
Naples, village.....	1,098	11	9	10	9	.....	.....
Phelps, town.....	3,405	53	47	42	32	26	35
Phelps, village.....	1,352	26	25	23	36	.....	.....
Richmond, town.....	1,380	20	21	28	16	6	11
Seneca, town.....	2,717	45	47	35	30	14	13
Shortsville, village.....	957	14	13	18	16	.....	.....
South Bristol, town.....	1,011	14	8	9	9	3	6
Victor, town.....	1,581	30	31	23	33	.....	9
Victor, village.....	806	17	15	11	16	.....	.....
West Bloomfield, town.....	1,244	23	17	19	18	8	7
Total.....	52,689	905	830	771	711	*366	315

* Includes 14 delayed returns.

Orange County

	Popula- tion	BIRTHS		DEATHS		MARRIAGES	
		1909	1908	1909	1908	1909	1908
Blooming Grove, town.....	1,435	8	15	18	18	19	9
Chester, town.....	923	35	27	16	18	13	11
Chester, village.....	1,205	16	25	18	29	.....	.....
Cornwall, town.....	2,945	32	37	34	44	42	31
Cornwall, village.....	1,945	38	28	32	29	.....	.....
Crawford, town.....	1,826	29	32	19	21	3	10
Deerpark, town.....	1,867	20	17	33	26	10	11
Goshen, town.....	1,924	43	33	59	52	37	47
Goshen, village.....	3,099	37	44	50	57	.....	.....
Greenville, town.....	672	9	7	12	9	.....	2
Hamptonburgh, town.....	1,158	25	12	22	11	4	3
Highlands, town.....	3,561	31	28	18	17	36	26
Highland Falls, village.....	.....	121	86	55	56	.....	.....
Middletown, city.....	14,516	281	193	256	217	131	106
Minerva, town.....	1,023	12	1	16	10	1	6
Monroe, town.....	1,030	11	3	17	13	.....	2
Monroe, village.....	1,008	30	26	22	28	.....	.....
Montgomery, town.....	1,954	44	34	40	27	47	49
Montgomery, village.....	1,961	17	23	17	19	.....	.....
Mount Hope.....	1,128	22	24	28	24	6	6
Newburgh, town.....	4,785	33	21	72	51	19	22
Newburgh, city.....	26,498	473	519	483	440	220	185
New Windsor, town.....	2,887	31	45	38	40	12	15
Port Jervis, city.....	9,965	174	177	183	175	69	83
Tuxedo, town.....	2,865	60	32	26	40	19	14
Unionville, village.....	331	5	7	5	11	.....	.....
Walden, village.....	3,737	81	75	58	80	.....	.....
Walkkill, town.....	2,736	32	30	33	37	13	18
Warwick, town.....	4,923	81	75	67	68	58	49
Warwick, village.....	1,767	42	36	26	27	.....	.....
Washington, village.....	664	5	7	6	11	.....	.....
Wayanda, town.....	1,574	15	25	13	17	9	8
Woodbury, town.....	1,822	34	47	33	45	13	14
Total.....	108,267	1,927	1,794	1,825	1,767	783	727

Orleans County

	Popula- tion	BIRTHS		DEATHS		MARRIAGES	
		1909	1908	1909	1908	1909	1908
Albion, town.....	1,225	21	30	47	36	50	46
Albion, village.....	5,174	80	137	65	79	.....	.....
Barre, town.....	1,809	34	27	26	18	4	10
Carlton, town.....	2,236	43	46	24	34	19	10
Clarendon, town.....	1,455	23	26	26	17	8	7
Gaines, town.....	1,839	22	30	19	19	8	7
Holley, village.....	1,506	33	39	28	20	.....	.....
Kendall, town.....	1,638	35	25	26	25	18	15
Lyndonville, village.....	512	12	10	6	9	.....	.....
Medina, village.....	5,114	92	84	97	93	.....	.....
Murray, town.....	2,425	57	64	22	26	37	23
Ridgeway, town.....	1,016	27	33	24	30	42	34
Shelby, town.....	3,900	35	26	27	26	37	26
Yates, town.....	1,449	25	18	13	17	17	14
Total.....	31,323	539	595	450	449	240	192

Oswego County

	Popula- tion	BIRTHS		DEATHS		MARRIAGES	
		1909	1908	1909	1908	1909	1908
Albion, town.....	1,262	21	17	27	25	10	20
Altmar, village.....	373	9	1	5	8	.....	.....
Amboy, town.....	771	7	5	10	6	5	6
Boyston, town.....	743	11	12	13	9	4	8
Central Square, village.....	334	5	5	9	9	.....	.....
Cleveland, village.....	753	7	11	12	7	.....	.....
Constantia, town.....	1,542	24	29	32	21	13	8
Fulton, city.....	8,847	219	203	167	150	101	59
Granby, town.....	2,038	28	24	27	26	13	5
Hannibal town.....	1,883	36	31	30	32	20	14
Hannibal, village.....	386	3	1	12	6	.....	.....
Hastings, town.....	1,839	34	27	24	30	14	18
Lacona, village.....	380	6	6	7	6	.....	.....
Mexico, town.....	1,810	27	27	35	45	25	12
Mexico, village.....	1,269	12	26	26	17	.....	.....
New Haven, town.....	1,399	16	25	18	22	7	3
Orwell, town.....	1,029	23	27	18	14	6	10
Oswego, town.....	2,550	52	50	57	52	15	9
Oswego, city.....	22,572	481	486	336	376	177	164
Palermo, town.....	1,361	27	24	15	28	13	7
Parish, town.....	868	18	16	15	11	10	10
Parish, village.....	515	2	11	7	5	.....	.....
Phoenix, village.....	1,524	42	24	33	34	.....	.....
Pulaski, village.....	1,575	21	28	18	33	.....	.....
Redfield, town.....	792	21	16	9	11	6	3
Richland, town.....	2,036	41	32	26	23	29	22
Sandy Creek, town.....	1,103	19	18	18	19	12	12
Sandy Creek, village.....	734	2	5	15	14	.....	.....
Schroeppel, town.....	1,362	19	22	12	28	18	29
Scriba, town.....	2,246	24	25	31	41	9	9
Volney, town.....	2,339	29	38	28	34	31	19
West Monroe, town.....	914	9	11	14	10	8	8
Williamstown, town.....	954	15	13	20	22	4	5
Total.....	70,110	1,310	1,296	1,126	1,774	*553	460

* Includes 3 delayed returns.

Otsego County

	Popula- tion	BIRTHS		DEATHS		MARRIAGES	
		1909	1908	1909	1908	1909	1908
Burlington, town.....	1,151	16	6	11	19	7	4
Butternuts, town.....	1,149	18	18	10	14	11	15
Cherry Valley, town.....	985	13	17	15	21	6	12
Cherry Valley, village.....	746	9	6	8	18	.....	.....
Cooperstown, village.....	2,446	38	48	55	49	.....	.....
Decatur, town.....	502	12	11	8	3	2	1
Edmeston, town.....	1,679	19	29	17	18	12	6
Exeter, town.....	1,033	7	12	16	17	5	3
Gilbertsville, village.....	469	3	5	11	7	.....	.....
Hartwick, town.....	1,817	39	15	32	34	15	14
Laurens, town.....	1,264	18	26	20	20	12	9
Laurens, village.....	236	14	2	3	2	.....	.....
Maryland, town.....	1,221	29	17	25	23	12	17
Middletown, town.....	1,869	26	24	35	30	16	11
Milford, town.....	1,387	20	29	20	17	15	10
Milford, village.....	526	9	11	12	8	.....	.....
Morris, town.....	1,019	14	21	23	12	9	15
Morris, village.....	561	8	2	7	8	.....	.....
New Lisbon, town.....	1,088	13	19	10	20	5	3
Oneonta, town.....	1,874	13	37	13	36	.....	77
Oneonta, city.....	8,054	137	167	152	155	85	.....
Otego, town.....	1,057	20	33	16	19	19	14
Otego, village.....	651	12	14	7	7	.....	.....
Otsego, town.....	2,036	35	23	22	36	36	40
Pittsfield, town.....	970	14	14	13	12	6	5
Plainfield, town.....	889	9	11	11	14	5	6
Richfield, town.....	949	26	7	16	15	15	12
Richfield Springs, village.....	1,684	57	27	22	30	.....	.....
Roseboom, town.....	954	12	13	12	20	5	2
Schenevus, village.....	560	5	10	9	16	.....	.....
Springfield, town.....	1,604	17	16	20	11	3	10
Unadilla, town.....	1,369	34	16	26	26	19	16
Unadilla, village.....	1,142	8	5	13	12	.....	.....
Westford, town.....	912	20	13	9	12	4	3
Worcester, town.....	2,328	36	40	40	52	14	19
Total.....	48,209	780	764	739	813	338	324

Putnam County

	Popula- tion	BIRTHS		DEATHS		MARRIAGES	
		1909	1908	1909	1908	1909	1908
Brewster, village.....	1,277	18	11	16	17	.....	.....
Carmel, town.....	2,601	39	41	57	36	9	23
Cold Springs, village.....	2,339	46	62	53	39	.....	.....
Kent, town.....	887	17	14	21	20	10	1
Nelsonville, village.....	671	14	10	16	12	.....	.....
Patterson, town.....	1,680	30	16	21	25	9	14
Phillipstown, town.....	1,967	17	19	29	28	30	28
Putnam Valley, town.....	949	11	13	27	15	4	3
South East, town.....	1,796	33	42	36	39	34	42
Total.....	14,169	225	228	276	231	*99	111

* Includes 3 delayed returns.

Rensselaer County

	Popula- tion	BIRTHS		DEATHS		MARRIAGES	
		1909	1908	1909	1908	1909	1908
Berlin, town.....	1,623	34	27	24	35	16	12
Brunswick, town.....	2,714	37	38	42	33	15	12
Castleton, village.....	1,267	24	26	15	23	.....	.....
East Greenbush, town.....	1,321	19	10	16	14	6	3
Grafton, town.....	1,075	9	10	15	19	4	4
Hoosick, town.....	2,966	13	66	45	38	64	73
Hoosick Falls, village.....	5,251	123	100	84	86	.....	.....
Nassau, town.....	1,536	26	20	25	31	15	12
Nassau, village.....	455	5	7	6	10	.....	.....
North Greenbush, town.....	1,222	11	9	26	33	8	4
Petersburg, town.....	1,350	22	17	16	25	4	8
Pittstown, town.....	3,099	31	35	58	41	18	27
Poestenkill, town.....	1,143	16	11	12	19	4	7
Rensselaer, city.....	10,715	158	140	175	150	64	86
Sand Lake, town.....	2,205	38	33	42	38	11	16
Schaghticoke, town.....	1,102	14	15	16	21	8	11
Schaghticoke, village.....	1,191	20	18	7	18	.....	.....
Schodack, town.....	3,157	58	56	56	56	35	27
Stephentown, town.....	1,424	23	24	26	24	14	10
Troy, city.....	76,910	1,006	887	1,488	1,542	614	604
Valley Falls, village.....	888	11	8	15	12	.....	.....
Total.....	122,637	1,698	1,557	2,208	2,268	900	916

Rockland County

	Popula- tion	BIRTHS		DEATHS		MARRIAGES	
		1909	1908	1909	1908	1909	1908
Clarkstown, town.....	7,021	105	95	100	95	42	28
Grand View-on-Hudson, vil- lage.....	356	6	4	7	5	.....	.....
Haverstraw, town.....	1,952	32	7	12	6	49	60
Haverstraw, village.....	6,182	64	78	94	88	.....	.....
Hillburn, village.....	878	22	21	12	20	.....	.....
Nyack, village.....	4,441	69	74	74	94	.....	.....
Orangetown, town.....	5,030	62	76	53	46	85	65
Piermont, village.....	1,193	11	6	25	32	.....	.....
Ramapo, town.....	4,026	83	87	77	74	62	52
South Nyack, village.....	1,848	38	24	18	19	.....	.....
Spring Valley, village.....	2,583	69	50	23	24	.....	.....
Stony Point, town.....	3,862	77	71	67	53	26	11
Suffern, village.....	2,655	43	58	53	51	.....	.....
Upper Nyack, village.....	648	5	11	11	9	.....	.....
West Haverstraw, village.....	2,348	40	36	49	35	.....	.....
Total.....	45,032	726	698	675	651	*279	216

* Includes 15 delayed returns.

St. Lawrence County

	Popula- tion	BIRTHS		DEATHS		MARRIAGES	
		1909	1908	1909	1908	1909	1908
Brasher, town.....	2,333	42	37	33	37	19	7
Canton, town.....	3,716	57	60	60	72	41	27
Canton, village.....	3,083	34	46	44	54	.....	.....
Clare, town.....	329	6	10	4	3	.....	.....
Clifton, town.....	1,717	46	89	23	23	17	19
Colton, town.....	2,099	40	35	37	24	7	10
De Kalb, town.....	2,161	40	39	20	24	16	20
De Peyster, town.....	952	13	17	10	6	7	5
Edwards, town.....	943	19	21	13	14	12	13
Edwards, village.....	438	11	16	5	6	.....	.....
Fine, town.....	2,371	44	50	41	26	9	8
Fowler, town.....	1,756	32	27	21	32	9	.....
Gouverneur, town.....	2,353	50	57	34	31	42	50
Gouverneur, village.....	4,229	48	73	64	64	.....	.....
Hammond, town.....	1,484	33	25	22	15	10	8
Hammond, village.....	385	8	12	7	7	.....	.....
Heron, town.....	988	15	22	9	15	9	8
Heron, village.....	517	13	8	6	11	.....	.....
Hopkinton, town.....	1,509	28	34	15	15	10	7
Lawrence, town.....	860	36	24	26	24	9	12
Lisbon, town.....	3,166	10	18	32	30	16	18
Louisville, town.....	1,553	30	30	21	17	8	7
Macomb, town.....	1,245	11	16	26	16	8	8
Madrid, town.....	1,664	29	22	23	24	11	3
Massena, town.....	1,692	35	34	27	3	37	33
Massena, village.....	2,547	103	101	66	52	.....	.....
Morristown, town.....	1,404	30	32	13	12	21	23
Morristown, village.....	429	10	3	7	5	.....	.....
Norfolk, town.....	2,864	81	72	39	40	18	16
Norwood, village.....	1,779	45	47	29	23	.....	.....
Odensburg, city.....	13,179	356	325	247	252	139	111
Oswegatchie, town.....	2,303	26	10	21	34	19	11
Parishville, town.....	2,111	39	48	35	39	8	10
Piercesfield, town.....	862	16	26	9	7	3	7
Pierrepont, town.....	1,641	17	12	16	22	9	11
Pitcairn, town.....	965	17	10	20	12	10	8
Potsdam, town.....	3,051	55	59	24	30	76	77
Potsdam, village.....	4,162	69	73	66	67	.....	.....
Richville, village.....	354	8	5	5	9	.....	.....
Rosie, town.....	1,192	15	16	10	18	12	5
Russell, town.....	2,036	36	35	27	22	22	6
Stockholm, town.....	2,711	35	51	32	32	22	21
Waddington, town.....	1,197	16	20	11	13	11	15
Waddington, village.....	708	12	8	17	2	.....	.....
Total.....	90,045	1,716	1,775	1,317	1,284	667	584

Saratoga County

	Popula- tion	BIRTHS		DEATHS		MARRIAGES	
		1909	1908	1909	1908	1909	1908
Ballston, town.....	2,040	13	17	18	22	12	6
Ballston Spa, village.....	4,131	68	85	60	72	.....	.....
Charlton, town.....	971	17	14	13	14	5	3
Clifton Park, town.....	2,247	38	30	36	26	15	11
Corinth, town.....	1,086	22	28	22	21	26	17
Corinth, village.....	2,186	51	55	25	27	.....	.....
Day, town.....	643	12	16	13	11	4	5
Edinburg, town.....	924	8	6	15	20	5	7
Galway, town.....	1,098	16	11	11	16	9	8
Galway, village.....	149	.....	2	.....	2	.....	.....
Greenfield, town.....	1,735	32	26	23	30	3	1
Hadley, town.....	776	11	15	9	8	4	3
Half Moon, town.....	1,868	14	9	25	25	47	34
Malta, town.....	1,324	6	2	27	14	11	5
Mechanicville, village.....	5,877	182	189	78	125	.....	.....

Saratoga County — Continued

	Popula- tion	BIRTHS		DEATHS		MARRIAGES	
		1909	1908	1909	1908	1909	1908
Milton, town.....	1,888	47	39	67	48	36	36
Moreau, town.....	1,094	16	20	19	13	25	15
Northumberland, town.....	1,255	24	25	18	17	5	5
Providence, town.....	538	7	11	7	6	2	2
Saratoga, town.....	1,715	24	33	23	20	37	27
Saratoga Springs, town.....	1,349	1	3	16	15	55	102
Saratoga Springs, village.....	12,999	246	234	249	250	.....	.....
Schuylerville, village.....	1,529	38	30	19	19	.....	.....
South Glens Falls, village.....	2,097	29	31	24	33	.....	.....
Stillwater, town.....	3,346	27	21	27	27	47	32
Stillwater, village.....	923	11	24	15	22	.....	.....
Victory, village.....	735	15	7	11	9	.....	.....
Waterford, town.....	2,876	61	52	34	56	32	43
Waterford, village.....	3,134	41	41	49	58	.....	.....
Wilton, town.....	1,004	12	7	9	15	8	7
Total.....	62,658	1,089	1,082	962	1,041	388	369

Schenectady County

	Popula- tion	BIRTHS		DEATHS		MARRIAGES	
		1909	1908	1909	1908	1909	1908
Duanesburgh, town.....	2,467	45	43	23	31	10	16
Glenville, town.....	2,012	23	23	26	32	17	21
Niskayuna, town.....	1,445	18	29	18	36	8	6
Princeton, town.....	653	8	4	4	5	7	5
Rotterdam, town.....	4,198	80	49	45	97	27	13
Schenectady, city.....	58,387	1,801	1,904	847	920	504	510
Scotia, village.....	2,166	50	59	26	35	.....	.....
Total.....	71,328	2,025	2,111	989	1,156	573	571

Schoharie County

	Popula- tion	BIRTHS		DEATHS		MARRIAGES	
		1909	1908	1909	1908	1909	1908
Blenheim, town.....	701	15	4	8	9	5	1
Broome, town.....	1,054	21	10	22	16	7	9
Carlisle, town.....	1,091	10	7	21	17	2	11
Cobleskill, town.....	1,573	29	24	23	27	19	23
Cobleskill, village.....	2,158	24	27	31	38	.....	.....
Conesville, town.....	734	10	10	10	11	1	.....
Esperance, town.....	773	9	2	11	4	10	.....
Esperance, village.....	231	2	5	4	6	.....	.....
Fulton, town.....	1,611	29	36	19	36	11	10
Glboos, town.....	1,425	23	26	26	19	3	13
Jefferson, town.....	1,304	28	22	20	17	9	.....
Middleburgh, town.....	1,457	23	24	25	27	18	11
Middleburgh, village.....	1,209	10	18	10	20	.....	.....
Richmondville, town.....	950	12	9	12	14	6	.....
Richmondville, village.....	587	6	7	15	18	.....	.....
Schoharie, town.....	1,752	23	18	25	16	11	.....
Schoharie, village.....	1,027	13	10	16	17	.....	.....
Seward, town.....	1,458	29	21	28	19	7	8
Sharon, town.....	1,467	19	20	28	21	20	13
Sharon Springs, village.....	526	9	8	5	4	.....	.....
Summit, town.....	1,146	17	10	21	20	9	14
Wright, town.....	1,060	8	13	18	13	9	7
Total.....	25,294	369	326	398	389	147	155

Schuyler County

	Popula- tion	BIRTHS		DEATHS		MARRIAGES	
		1909	1908	1909	1908	1909	1908
Burdette, village.....	378	3	7	11	13	.....	.....
Catherine, town.....	914	10	13	17	13	8	4
Cayuta, town.....	383	4	8	2	8	4	.....
Dix, town.....	952	8	14	19	28	40	34
Hector, town.....	3,510	46	41	41	58	30	16
Montour, town.....	414	6	2	3	8	8	15
Montour Falls, village.....	1,236	14	13	26	32	.....	.....
Odesa, village.....	354	2	6	2	9	.....	.....
Orange, town.....	1,197	12	10	16	13	10	9
Reading, town.....	1,412	15	22	22	16	4	9
Tyrone, town.....	1,411	18	29	22	21	8	6
Watkins, village.....	2,957	53	52	39	47	.....	.....
Total.....	15,122	191	217	220	266	112	93

Seneca County

	Popula- tion	BIRTHS		DEATHS		MARRIAGES	
		1909	1908	1909	1908	1909	1908
Covert, town.....	1,237	19	23	15	17	11	10
Fayette, town.....	2,718	31	35	39	23	15	8
Interlaken, village.....	717	12	6	8	13	.....	.....
Junius, town.....	908	16	15	15	16	8	7
Lodi, town.....	1,540	21	19	23	16	5	11
Ovid, town.....	1,444	19	14	18	16	12	8
Ovid, village.....	577	2	8	16	10	.....	.....
Romulus, town.....	2,017	29	33	34	23	10	17
Seneca Falls, town.....	811	2	3	7	11	46	49
Seneca Falls, village.....	6,733	128	134	101	107	.....	.....
Tyre, town.....	908	24	21	13	12	6	6
Varick, town.....	1,196	22	19	22	18	11	8
Waterloo, town.....	474	19	15	23	17	37	34
Waterloo, village.....	4,123	60	75	71	68	.....	.....
Total.....	25,315	404	420	405	367	161	158

Steuben County

	Popula- tion	BIRTHS		DEATHS		MARRIAGES	
		1909	1908	1909	1908	1909	1908
Addison, town.....	537	25	13	6	19	28	23
Addison, village.....	2,027	15	19	47	20	.....	.....
Avoca, town.....	1,125	36	28	17	20	18	12
Avoca, village.....	1,026	23	9	11	14	.....	.....
Bath, town.....	2,794	39	53	59	76	42	56
Bath, village.....	3,695	34	45	50	44	.....	.....
Bradford, town.....	620	12	7	8	5	1	3
Cameron, town.....	1,217	21	19	14	14	9	8
Campbell, town.....	1,350	9	16	21	18	6	6
Canisteo, town.....	1,186	15	15	12	15	35	25
Canisteo, village.....	1,985	41	23	46	27	.....	.....
Caton, town.....	1,215	14	11	20	15	15	11
Cohocton, town.....	2,158	43	47	21	25	32	9
Cohocton, village.....	826	18	15	12	16	.....	.....
Corning, town.....	2,212	31	42	27	31	15	10
Corning, city.....	13,515	271	269	217	233	137	104

Steuben County — Continued

	Popula- tion	BIRTHS		DEATHS		MARRIAGES	
		1909	1908	1909	1908	1909	1908
Dansville, town.....	1,270	15	20	17	12	12	10
Erwin, town.....	1,046	20	22	20	22	16	12
Fremont, town.....	914	6	5	9	9	5	7
Greenwood, town.....	1,082	23	10	12	10	10	10
Hammondsport, village.....	1,141	21	18	22	22	.....	.....
Hartsville, town.....	664	7	13	5	4	7	.....
Hornby, town.....	940	15	16	13	16	4	4
Hornell, city.....	13,259	301	268	185	209	113	115
Hornellsville, town.....	1,942	10	23	41	22	15	17
Howard, town.....	1,530	15	26	20	22	9	7
Jasper, town.....	1,365	38	40	17	18	8	13
Lindley, town.....	1,174	21	35	15	15	9	13
Painted Post, village.....	1,061	20	21	16	12	.....	.....
Prattsburg, town.....	1,204	25	11	3	3	9	14
Prattsburg, village.....	694	5	4	10	7	.....	.....
Pulteney, town.....	1,384	18	23	26	20	9	8
Rathbone, town.....	973	19	11	12	9	6	6
Savona, village.....	596	5	15	16	7	.....	.....
Thurston, town.....	927	23	8	12	10	5	4
Troupsburg.....	1,725	51	34	21	20	26	20
Tuscarora, town.....	1,070	18	14	14	17	11	8
Urbana, town.....	1,376	19	15	18	21	23	20
Wayland, town.....	1,480	22	27	19	18	16	19
Wayland, village.....	1,220	29	29	19	17	.....	.....
Wayne, town.....	682	13	7	13	6	7	3
West Union, town.....	1,011	21	21	12	12	5	5
Wheeler, town.....	1,006	7	10	9	10	6	8
Woodhull, town.....	1,226	14	20	18	19	16	14
Woodhull, village.....	342	5	8	4	4	.....	.....
Total.....	81,814	1,453	1,405	1,216	1,185	*689	604

* Includes 4 delayed returns.

Suffolk County

	Popula- tion	BIRTHS		DEATHS		MARRIAGES	
		1909	1908	1909	1908	1909	1908
Amityville, village.....	2,429	7	8	61	44	.....	.....
Babylon, town.....	3,133	87	65	70	70	55	55
Babylon, village.....	2,357	53	44	28	23	.....	.....
Brookhaven, town.....	12,604	232	184	203	202	104	107
East Hampton, town.....	4,303	84	80	44	30	23	26
Greenport, village.....	2,667	112	*71	33	52	.....	.....
Huntington, town.....	8,433	162	159	129	121	74	54
Islip, town.....	13,721	270	†301	167	193	79	93
Northport, village.....	1,803	46	50	27	29	.....	.....
Patchogue, village.....	3,446	115	82	48	49	.....	.....
Riverhead, town.....	4,960	59	59	58	68	33	39
Sag Harbor, village.....	3,048	68	68	34	44	.....	.....
Shelter Island, town.....	1,105	22	22	15	9	14	13
Smithtown, town.....	3,325	85	58	56	51	17	24
Southampton, town.....	5,763	122	100	92	79	74	70
Southampton, village.....	2,213	50	49	23	24	.....	.....
Southold, town.....	6,322	120	120	66	63	65	59
Total.....	81,653	1,694	1,520	1,154	1,151	538	540

*12 delayed. †21 delayed.

Sullivan County

	Popula- tion	BIRTHS		DEATHS		MARRIAGES	
		1909	1908	1909	1908	1909	1908
Bethel, town.....	2,154	25	30	29	26	13	7
Callicoon, town.....	2,026	36	34	36	26	18	14
Cochecton, town.....	1,123	22	26	12	23	6	9
Delaware, town.....	1,814	41	35	28	35	9	11
Fallsburgh, town.....	3,810	97	86	75	61	21	19
Forestburgh, town.....	544	5	6	6	8	4	2
Fremont, town.....	2,110	29	40	38	16	.....	2
Highland, town.....	975	20	15	15	19	5	13
Liberty, town.....	3,359	58	52	81	85	31	35
Liberty, village.....	2,124	40	36	71	92	.....	.....
Lumberland, town.....	749	12	10	8	7	1	1
Mamakating, town.....	2,691	38	45	50	52	19	23
Monticello, village.....	1,388	38	43	51	36	.....	.....
Neversink, town.....	2,009	29	16	20	28	14	12
Rockland, town.....	3,714	50	65	52	52	29	27
Thompson, town.....	2,777	25	30	45	37	40	45
Tusten, town.....	907	25	23	14	19	8	18
Wurtsboro, village.....	508	5	8	8	8	.....	.....
Total.....	34,795	595	600	639	630	*219	241

*Includes one delayed return.

Tioga County

	Popula- tion	BIRTHS		DEATHS		MARRIAGES	
		1909	1908	1909	1908	1909	1908
Barton, town.....	1,744	10	18	29	28	78	80
Berkshire, town.....	919	10	17	10	17	8	8
Candor, town.....	2,346	36	33	30	37	27	17
Candor, village.....	802	12	11	22	11	.....	.....
Newark Valley, town.....	1,193	29	28	24	25	18	15
Newark Valley, village.....	909	15	13	12	16	.....	.....
Nichols, town.....	1,004	5	11	19	16	8	9
Nichols, village.....	452	2	2	11	11	.....	.....
Owego, town.....	2,994	48	61	66	67	70	74
Owego, village.....	5,010	43	64	92	91	.....	.....
Richford, town.....	1,001	14	20	12	18	9	7
Spencer, town.....	980	11	25	14	24	12	13
Spencer, village.....	618	5	13	13	17	.....	.....
Tioga, town.....	2,017	31	26	30	45	9	14
Waverly, village.....	4,915	64	82	71	78	.....	.....
Total.....	26,907	335	424	455	501	239	23

Tompkins County

	Popula- tion	BIRTHS		DEATHS		MARRIAGES	
		1909	1908	1909	1908	1909	1908
Caroline, town.....	1,704	25	39	26	24	12	8
Danby, town.....	1,246	19	20	21	15	4	6
Dryden, town.....	2,474	33	41	30	35	19	17
Dryden, village.....	749	14	9	7	17	.....	.....
Enfield, town.....	1,111	13	21	14	13	5	3
Freeville, village.....	493	3	4	8	6	.....	.....
Groton, town.....	2,022	29	33	26	40	24	25
Groton, village.....	1,188	10	15	14	16	.....	.....
Ithaca, town.....	1,573	18	17	28	18	4	4

Tompkins County—Continued

	Popula- tion	BIRTHS		DEATHS		MARRIAGES	
		1909	1908	1909	1908	1909	1908
Ithaca, city.....	14,615	291	228	217	248	127	139
Lansing, town.....	2,653	43	41	52	35	24	5
Newfield, town.....	1,338	18	16	12	15	7	8
Newfield, village.....	347	6	4	2	7	.....	.....
Trumansburg, village.....	1,202	16	13	25	28	.....	.....
Ulysses, town.....	1,428	21	14	26	32	13	17
Total.....	34,151	559	515	508	549	239	232

Ulster County

	Popula- tion	BIRTHS		DEATHS		MARRIAGES	
		1909	1908	1909	1908	1909	1908
Denning, town.....	688	13	8	10	6	3	2
Ellenville, village.....	2,872	45	33	54	43	.....	.....
Esopus, town.....	4,205	69	79	50	58	29	28
Gardiner, town.....	1,473	30	29	33	19	4	9
Hardenbergh, town.....	657	9	10	8	6	6	4
Hurley, town.....	1,677	27	26	22	33	8	9
Kingston, town.....	439	2	12	5	6	.....	.....
Kingston, city.....	25,556	499	570	519	443	170	184
Lloyd, town.....	2,722	31	42	58	42	22	17
Marbletown, town.....	2,988	73	36	67	43	21	23
Marlborough, town.....	3,917	63	54	50	42	36	25
Marlborough, village.....	.....	15	14	13	12	.....	.....
New Paltz, town.....	1,192	17	18	40	32	16	13
New Paltz, village.....	970	17	11	19	28	.....	.....
Olive, town.....	2,347	70	59	72	57	40	15
Pine Hill, village.....	520	3	3	7	6	.....	.....
Plattekill, town.....	1,823	14	22	24	20	9	7
Rifton, village.....	581	11	13	9	3	.....	.....
Rochester, town.....	2,822	24	31	40	35	17	25
Rosendale, town.....	3,271	55	50	44	45	29	19
Rosendale, village.....	1,399	15	26	20	31	.....	.....
Saugerties, town.....	5,914	119	132	85	96	60	43
Saugerties, village.....	3,833	78	52	60	43	.....	.....
Shandaken, town.....	2,525	35	45	45	31	13	22
Shawangunk, town.....	2,467	58	46	42	40	16	18
Ulster, town.....	3,797	112	26	46	43	19	21
Wawarsing, town.....	4,343	60	70	68	74	46	53
Woodstock, town.....	1,665	28	30	20	26	16	15
Total.....	86,660	1,592	1,547	1,530	1,363	*583	552

*Includes 3 delayed returns.

Warren County

	Popula- tion	BIRTHS		DEATHS		MARRIAGES	
		1909	1908	1909	1908	1909	1908
Bolton, town.....	1,561	24	19	15	17	5	15
Caldwell, town.....	1,845	20	10	20	14	16	12
Chester, town.....	1,965	28	18	30	34	5	18
Glens Falls, city.....	14,650	243	234	232	209	116	110
Hague, town.....	1,054	32	12	18	9	6	5
Horicon, town.....	1,114	17	9	16	16	8	10
Johnsbury, town.....	2,364	22	40	38	47	17	20
Lake George, village.....	644	9	9	8	14	.....	.....
Luzerne, town.....	1,371	17	23	21	17	15	9
Queensbury, town.....	2,131	45	48	38	43	14	23
Stony Creek, town.....	910	19	13	12	9	6	8
Thurman, town.....	833	11	13	13	8	6	5
Warrensburgh, town.....	2,483	37	36	52	48	29	19
Total.....	31,935	524	484	513	485	243	254

Washington County

	Popula- tion	BIRTHS		DEATHS		MARRIAGES	
		1909	1908	1909	1908	1909	1908
Argyle, town.....	1,575	29	31	24	27	11	14
Argyle, village.....	246	5	1	5	4	.....	.....
Cambridge, town.....	246	5	11	18	34	13	12
Cambridge, village.....	1,604	25	22	33	21	.....	.....
Dresden, town.....	620	7	15	5	3	.....	.....
Easton, town.....	2,210	31	25	20	15	11	9
Fort Ann, town.....	1,812	26	37	31	29	12	22
Fort Ann, village.....	438	12	8	13	10	.....	.....
Fort Edward, town.....	1,494	50	22	23	19	33	44
Fort Edward, village.....	3,806	76	69	49	60	.....	.....
Granville, town.....	2,623	36	26	34	40	70	72
Granville, village.....	3,864	79	80	56	50	.....	.....
Greenwich, town.....	2,342	37	27	42	23	31	38
Greenwich, village.....	1,996	29	30	33	32	.....	.....
Hampton, town.....	671	20	16	5	14	5	4
Hartford, town.....	1,270	12	11	19	17	6	12
Hebron, town.....	1,599	19	11	20	16	3	7
Jackson, town.....	1,052	14	6	20	17	5	2
Kingsbury, town.....	1,713	24	29	33	28	64	45
Putnam, town.....	507	12	10	9	9	1	1
Salem, town.....	1,489	29	19	23	27	17	26
Salem, village.....	1,313	19	17	22	34	.....	.....
Hudson Falls, village.....	5,321	91	132	72	80	.....	.....
White Creek, town.....	2,425	4	31	27	16	13	13
Whitehall, town.....	960	19	10	14	18	64	76
Whitehall, village.....	4,143	130	142	102	68	.....	.....
Total.....	47,376	840	838	752	711	359	387

Wayne County

	Popula- tion	BIRTHS		DEATHS		MARRIAGES	
		1909	1908	1909	1908	1909	1908
Arcadia, town.....	2,556	31	24	25	20	74	62
Butler, town.....	1,704	23	27	31	18	11	13
Clyde, village.....	2,552	60	63	41	44	.....	.....
Galen, town.....	1,908	31	28	36	28	28	30
Huron, town.....	1,592	25	33	23	27	7	10
Lyons, town.....	909	19	46	31	23	60	37
Lyons, village.....	4,758	78	63	85	66	.....	.....
Macedon, town.....	1,938	34	52	29	30	13	14
Macedon, village.....	677	3	10	10	12	.....	.....
Marion, town.....	2,025	34	40	28	28	15	10
Newark, village.....	4,554	96	99	83	85	.....	.....
Ontario, town.....	2,604	73	57	37	38	21	19
Palmyra, town.....	1,946	33	32	24	32	27	25
Palmyra, village.....	2,096	42	31	33	39	.....	.....
Red Creek, village.....	499	7	9	9	6	.....	.....
Rose, town.....	1,888	45	33	36	32	12	13
Savannah, town.....	1,138	21	23	19	14	9	16
Savannah, village.....	544	5	14	8	5	.....	.....
Sodus, town.....	4,997	79	55	84	62	32	28
Walworth, town.....	2,156	49	43	28	20	12	10
Williamson, town.....	2,912	49	62	42	30	28	24
Wolcott, town.....	1,312	32	29	38	23	17	24
Wolcott, village.....	1,294	7	12	14	15	.....	.....
Total.....	48,564	876	885	794	697	*377	335

* Includes 1 delayed return.

Westchester County

	Popula- tion	BIRTHS		DEATHS		MARRIAGES	
		1909	1908	1909	1908	1909	1908
Ardsey, village.....	470	12	8	9	3	.....	.....
Bedford, town.....	4,759	78	91	70	57	33	42
Briarcliff Manor, village.....	417	18	9	11	7	.....	.....
Bronxville, village.....	994	22	21	20	8	.....	.....
Cortlandt, town.....	6,230	112	112	81	76	146	94
Croton-on-Hudson, village.....	1,599	40	24	25	29	.....	.....
Dobbs Ferry, village.....	3,515	53	71	78	66	.....	.....
Eastchester, town.....	1,412	38	33	21	18	36	33
Greenburgh, town.....	3,740	74	41	54	63	145	108
Harrison, town.....	2,922	66	59	48	51	14	26
Hastings-on-Hudson, village.....	3,060	99	63	44	39	.....	.....
Irvington, village.....	2,480	53	42	22	35	.....	.....
Larchmont, village.....	1,760	15	17	12	13	.....	.....
Lewisboro, town.....	1,542	24	14	12	26	7	6
Mamaroneck, town.....	*5,853	7	7	6	16	40	35
Mamaroneck, village.....	5,090	109	137	75	69	.....	.....
Mt. Kisco, village.....	1,830	51	32	31	40	.....	.....
Mount Pleasant, town.....	3,393	53	48	182	201	57	80
Mount Vernon, city.....	25,006	789	599	383	388	220	174
New Castle, town.....	1,126	32	27	25	27	15	11
New Rochelle, city.....	20,480	721	721	323	329	198	191
North Castle, town.....	1,483	17	23	16	15	12	6
North Pelham, village.....	1,850	30	19	15	19	.....	.....
North Salem, town.....	1,169	22	17	18	22	6	11
North Tarrytown, village.....	4,750	212	56	82	94	.....	.....
Ossining, town.....	2,764	1	1	4	6	68	63
Ossining, village.....	7,135	185	159	179	160	.....	.....
Peekskill, village.....	13,200	310	286	246	254	.....	.....
Pelham, town.....	†11,841	.....	2	.....	.....	14	10
Pelham, village.....	349	4	6	3	2	.....	.....
Pelham Manor, village.....	638	13	13	7	8	.....	.....
Pleasantville, village.....	1,585	42	56	20	25	.....	.....
Port Chester, village.....	11,168	401	175	207	173	.....	.....
Poundridge, town.....	768	7	10	10	15	3	9
Rye, town.....	2,803	7	5	6	2	203	171
Rye, village.....	4,076	69	62	60	51	.....	.....
Scarsdale, town.....	1,018	26	21	15	15	7	9
Sherman Park, village.....	.....	13	.....	54	.....	.....	.....
Somers, town.....	1,175	27	18	25	23	4	7
Tarrytown, village.....	5,370	87	89	84	81	.....	.....
Tuckahoe, village.....	1,580	99	95	41	29	.....	.....
White Plains, town.....	550	2	2	7	6	110	104
White Plains, village.....	11,679	420	380	234	200	.....	.....
Yonkers, city.....	61,716	1,961	1,948	1,125	1,065	704	634
Yorktown, town.....	2,294	44	29	47	42	12	10
Total.....	228,950	6,495	5,648	4,044	3,868	‡2,068	1,834

* Includes population of villages of Mamaroneck and Larchmont.

† Includes population of villages of Pelham and North Pelham.

‡ Includes 14 delayed returns.

Wyoming County

	Popula- tion	BIRTHS		DEATHS		MARRIAGES	
		1909	1908	1909	1908	1909	1908
Arcade, town.....	887	9	13	12	21	21	17
Arcade, village.....	1,052	21	34	22	16	.....	.....
Attica, town.....	905	18	17	12	10	.....	11
Attica, village.....	1,816	35	36	32	25	.....	.....
Bennington, town.....	1,861	29	27	18	20	5	11
Castile, town.....	1,386	19	11	23	6	16	17
Castile, village.....	1,000	15	9	17	13	.....	.....
Covington, town.....	957	13	11	12	13	5	3

Wyoming County — Continued

	Popula- tion	BIRTHS		DEATHS		MARRIAGES	
		1909	1908	1909	1908	1909	1908
Eagle, town.....	1,152	24	24	16	13	10	10
Gainesville, town.....	1,412	24	17	13	18	24	17
Gainesville, village.....	309	3	4	9	4	.....	.....
Genesee Falls, town.....	633	12	9	9	8	1	4
Java, town.....	1,663	20	21	27	27	10	10
Middlebury, town.....	1,378	20	21	20	17	6	8
Orangeville, town.....	890	19	13	16	20	3	5
Perry, town.....	1,160	23	17	22	8	71	57
Perry, village.....	3,749	68	81	50	55	.....	.....
Pike, town.....	774	9	10	9	10	5	8
Pike, village.....	457	5	6	4	5	.....	.....
Sheldon, town.....	1,742	38	30	27	18	17	12
Silver Springs, village.....	817	20	24	6	8	.....	.....
Warsaw, town.....	1,273	21	24	14	16	28	29
Warsaw, village.....	3,196	49	36	35	41	.....	.....
Wethersfield, town.....	869	20	9	5	15	5	7
Total.....	31,355	534	504	430	407	227	226

Yates County

	Popula- tion	BIRTHS		DEATHS		MARRIAGES	
		1909	1908	1909	1908	1909	1908
Barrington, town.....	1,119	10	20	11	12	10	6
Benton, town.....	2,137	24	25	21	19	13	13
Dresden, village.....	321	7	4	8	4	.....	.....
Dundee, village.....	1,282	15	13	15	18	.....	.....
Italy, town.....	897	14	11	15	5	9	4
Jerusalem, town.....	2,554	26	37	45	42	9	3
Middlesex, town.....	1,202	26	19	13	8	7	10
Milo, town.....	1,579	27	18	21	23	53	35
Penn Yan, village.....	4,504	46	31	75	79	.....	.....
Potter, town.....	*1,568	25	23	15	19	12	10
Rushville, village.....	†500	5	9	4	13	.....	.....
Starkey, town.....	1,560	21	16	16	17	19	19
Torrey, town.....	680	9	14	10	8	2	2
Total.....	19,408	255	240	272	267	134	122

* Part of village in Ontario county.

† Including population of village of Rushville in county of Yates.

Summary of Mortality for the Year 1909

Of the 140,261 deaths occurring in the State, pulmonary tuberculosis caused 13,996, or about 10 per cent. In 1908 there were 14,347 deaths from pulmonary tuberculosis, and the year before 14,431.

During the last twenty-five years, during which the population of the State has increased from 5,600,000 to 8,600,000, there have been 330,000 deaths from pulmonary tuberculosis — a yearly average of 13,000.

The urban mortality from tuberculosis during 1909 was 175 per 100,000 population, and the rural 120.

There were 2,112 deaths from tuberculosis other than pulmonary, viz.: Laryngeal, 127; meningeal, 1,113; abdominal, 390; Pott's disease, 92; tuberculous abscess, 27; general tuberculosis, 165; other tubercular diseases, 207; making a total of 16,117 deaths from tuberculosis, or 11.5 per cent. of the total deaths occurring in the State.

Pneumonia caused 9,423 deaths, 796 more than in 1908. Influenza was given as the cause of 1,122 deaths. From other diseases of the respiratory organs there were 11,406 deaths.

Cancer caused 7,060 deaths, which is an increase of 506 over the reported mortality for 1908. The urban death rate was 78 per 100,000 population, and the rural 86. In 1908 it was 74 and 79, and in 1907 it was 76 and 77, respectively. The average yearly deaths from cancer during the past twenty-five years is 4,227, the reported mortality having increased from 1,887 in 1885 to 7,034 in 1909, and the death rate has increased from 33.6 to 80.0 per 100,000 population.

Bright's disease caused 9,393 deaths, an increase of 871 over 1908.

Violence was the cause of 9,232 deaths. The rate of deaths per 100,000 population in the urban and rural districts was nearly identical — 107 and 104. The total number was about the same as in 1908, 9,183.

There were 1,494 deaths by suicide, which is twelve less than 1908, and 279 more than occurred in 1907. The chief modes of death were fire-arms, 412; poisoning, 341, and asphyxia, 308. There were 62 suicides from drowning and 201 by hanging.

The mortality from typhoid fever was 1,315, which is 60 less than in 1908. The death rate from typhoid fever is the lowest ever recorded in the State, being 15.0 per 100,000 population.

There were 7,873 deaths from diarrhea and enteritis under two years of age — 1,238 less than in 1908, and 1,940 less than in 1907. Of these deaths, 85 per cent were urban.

While the childhood mortality was a little more than that of 1908, there were less deaths in the first year of life, and mostly in the urban population. Compared with 1907 the decrease is more

marked, nearly 2,000 fewer deaths occurring under one year of age — principally in the urban mortality. There was a decrease in the percentage of annual number of deaths under one year to 1,000 living births, and also deaths under one year to total deaths.

Diphtheria continues to be an urban disease, the mortality in Greater New York being 38 per 100,000 population, and the continued rate in all of the cities was little less (32), while in rural parts of the State there were but 10 deaths per 100,000 population. The total mortality from diphtheria was 2,313, which is slightly under that of 1908.

There were 1,205 deaths from scarlet fever, and 1,272 from measles.

Cerebro-spinal meningitis caused 485 deaths.









The total mortality from epidemic diseases was 9,049, or 6.5 per cent. of the deaths from all causes. Including pneumonia and tuberculosis, there were 32,468 deaths from zymotic diseases, or 23.0 per cent. of all deaths.

Old age mortality is increased by 1,573 as compared with that of 1908 — 43,298 deaths, a little more than one-third of the total, having occurred at and over the age of sixty.

The following table shows the mortality in the State by age periods, sex, color, nationality, etc., outside of the cities of Buffalo and Greater New York as published in the monthly BULLETIN.

AGE	TOTAL		WHITE		NEGRO		OTHER COLORED		NATIVE	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Under 1,	4,972	3,908	4,872	3,836	98	67	2	5	4,956	3,889
1-4	1,629	1,470	1,598	1,437	30	29	1	4	1,588	1,433
5-9	540	463	528	459	11	3	1	1	507	442
10-14	385	310	379	299	5	11	1	1	365	295
15-19	685	551	670	529	14	22	1	1	583	500
20-29	2,008	1,671	1,939	1,614	63	55	6	2	1,473	1,370
30-39	2,454	1,932	2,393	1,874	60	57	1	1	1,790	1,503
40-49	2,774	2,139	2,717	2,104	52	33	5	2	1,921	1,599
50-59	3,432	2,767	3,365	2,714	65	49	2	4	2,447	2,083
60-69	4,615	4,175	4,554	4,129	59	43	2	3	3,075	2,684
70-79	5,070	4,939	5,026	4,903	41	35	3	1	3,338	3,371
80 and over	3,274	3,757	3,243	3,723	30	28	1	6	2,264	2,650
Unknown,	93	32	91	30	2	2	.....	.....	24	18
Total,	31,931	28,114	31,375	27,651	530	434	26	29	24,331	21,837

DEATH RATE & PER CENT OF DEATHS ^{AT} DIFFERENT AGE PERIODS 1909

AGE PERIOD	Nº OF DEATHS	DEATH RATE PER 1000 LIVING AT ALL AGES	PER CENT OF TOTAL MORTALITY
<i>UNDER 1 YEAR</i>	26.077 	3.0	18.5
<i>1 YEAR TO 4 YEARS</i>	12.201 	1.4	8.7
5 " " 9 "	2.971 	.34	2.1
10 " " 19 "	4.691 	.54	3.3
20 " " 39 "	22.519 	2.6	16.1
40 " " 59 "	28.379 	3.8	22.3
60 " " 79 "	32.950 	3.8	23.5
<i>OVER 80</i> "	10.348 	1.2	7.4
<i>UNKNOWN</i>	.1251	.14	.9
TOTAL DEATHS AT ALL AGES	140.261		100.0

AGE	FOREIGN BORN		NATIVITY UNKNOWN		SINGLE		MARRIED		WIDOWED AND DIVORCED	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Under 1.....	15	18	1	1	4,972	3,908				
1-4.....	40	36	1	1	1,629	1,470				
5-9.....	31	21	2		540	463				
10-14.....	19	15	1		364	310			1	
15-19.....	94	46	8	5	676	472	5	75	2	3
20-29.....	492	293	43	8	1,418	654	533	966	17	36
30-39.....	587	415	77	14	980	361	1,319	1,474	97	101
40-49.....	772	521	81	19	710	339	1,836	1,507	158	281
50-59.....	902	661	83	23	583	368	2,374	1,730	413	661
60-69.....	1,476	1,459	64	32	485	402	3,028	1,874	1,071	1,890
70-79.....	1,678	1,532	54	36	369	428	2,807	1,231	1,857	3,272
80 and over.....	972	1,076	38	31	138	294	1,254	342	1,862	3,115
Unknown.....	30	9	39	5	11	11	14	6	6	11
Total.....	7,108	6,102	492	175	12,895	9,480	13,170	9,205	5,484	9,369

Marital condition unknown, 442: Males, 382, Females, 60

The classification by age, nativity, social relations, etc., for the cities of New York and Buffalo are not published in the BULLETIN but are given in tables below as classified by their respective city Departments of Health.

Deaths in Buffalo During the Year 1909

AGE	TOTAL		WHITE		NEGRO		NATIVE	
	Male	Female	Male	Female	Male	Female	Male	Female
Under 1.....	709	529	706	528	3	1	709	526
1-4.....	279	263	279	263			263	256
5-9.....	113	102	112	102	1		110	92
10-14.....	53	52	53	50		2	48	49
15-19.....	92	76	91	76	1		75	66
20-29.....	256	221	255	216	1	5	160	154
30-39.....	315	218	306	213	9	5	185	127
40-49.....	371	262	367	262	4		188	143
50-59.....	377	260	376	258	1	2	194	141
60-69.....	324	289	321	285	3	4	121	103
70-79.....	282	304	282	302		2	89	98
80 and over.....	164	200	163	197	1	3	41	51
Unknown.....								
Total.....	3,335	2,776	3,311	2,752	24	24	2,183	1,806

AGE	FOREIGN BORN		NATIVITY UNKNOWN		SINGLE		MARRIED		WIDOWED AND DIVORCED	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Under 1.....		3			709	529				
1-4.....	16	7			279	263				
5-9.....	8	10			113	102				
10-14.....	5	3			53	52				
15-19.....	17	10			91	69	1	7		
20-29.....	94	67	2		193	93	62	124	1	4
30-39.....	127	91	3		123	38	183	102	9	18
40-49.....	180	118	3	1	91	35	251	196	29	31
50-59.....	179	119	4		63	34	262	155	52	71
60-69.....	202	186	1		30	24	229	100	65	165
70-79.....	192	206	1		23	19	153	70	106	215
80 and over.....	122	149	1		6	11	54	17	104	172
Unknown.....										
Total.....	1,137	969	15	1	1,774	1,269	1,195	831	366	676

Deaths in New York City According to Age and Color

BOROUGH	Under 1 year	1	2	3	4	Total under 5	5	10	15
Manhattan.....	8,915	2,540	1,001	567	364	13,387	830	476	677
The Bronx.....	991	282	140	77	45	1,555	142	102	195
Brooklyn.....	4,923	1,624	673	416	249	7,865	638	315	505
Queens.....	851	218	92	55	42	1,258	111	57	92
Richmond.....	297	77	30	16	16	436	31	17	25
City.....	15,977	4,741	1,931	1,131	736	24,521	1,752	967	1,494

BOROUGH	20	25	30	35	40	45	50	55	60	65
Manhattan.....	1,226	1,629	1,794	2,156	2,214	2,306	2,065	1,912	2,131	1,817
The Bronx.....	303	399	421	480	440	372	370	307	269	306
Brooklyn.....	833	956	1,135	1,292	1,247	1,257	1,313	1,236	1,436	1,337
Queens.....	131	152	146	179	187	207	218	180	218	237
Richmond.....	38	52	67	88	68	80	91	61	100	98
City.....	2,531	3,188	3,563	4,195	4,156	4,123	4,057	3,694	4,256	3,795

BOROUGH	70	75	80	85	Total	Colored	Chinese	Death-rate	Corrected inter-borough death-rate*
Manhattan.....	1,439	1,010	584	498	37,963	1,325	71	16.12	16.40
The Bronx.....	258	210	115	79	6,424	191	.....	18.46	16.12
Brooklyn.....	1,137	922	542	379	24,365	534	7	15.33	15.90
Queens.....	193	141	68	63	3,838	91	.....	15.67	16.14
Richmond.....	91	79	50	43	1,515	35	.....	19.43	18.62
City.....	3,118	2,362	1,359	972	74,105	2,176	78	16.23	.....

* Corrected interborough death-rate means that the death-rate of each borough is corrected by the exclusion of the deaths of residents of the other boroughs occurring within its limits and the inclusion of the deaths of residents of that borough occurring in other boroughs.

The following table shows the total number of deaths occurring in the State during the year, and the sex, color, social relations and nativity:

Sex	Color	Social relations
Males..... 75,599	White..... 136,944	Married..... 47,245
Females..... 64,662	Negro..... 3,185	Widows..... 14,401
Unknown..... 0	Mongolian..... 77	Widowers..... 13,512
	Indian..... 55	Single..... 64,065
		Divorced..... 100
		Unknown..... 938
Total..... 140,261	140,261	140,261
NATIVITIES		
United States..... 96,516	Foreign..... 42,695	Unknown..... 1,050

The following shows:

Death Rate and Per Cent. of Deaths at Different Age Periods

AGE PERIOD	Number of deaths	Death rate per 1,000 living at all ages	Per cent. of total mortality
Under one year.....	28,077	3.0	18.5
One to four years.....	12,201	1.4	8.7
Five to nine years.....	2,971	.34	2.1
Ten to nineteen years.....	4,691	.54	3.3
Twenty to thirty-nine years.....	22,519	2.6	16.1
Forty to fifty-nine years.....	28,379	3.3	22.3
Sixty to seventy-nine years.....	32,950	3.8	23.5
Over eighty years.....	10,348	1.2	7.4
Unknown.....	125	.14	.9
■ Total deaths at all ages.....	140,261	16.1	100.0

The following shows:

Death Rate and Per Cent. of Deaths from Different Causes

	Number of deaths	Death rate per 1,000 living	Per cent. of total mortality
1. General diseases.....	41,018	4.71	29.2
2. Diseases of nervous system.....	11,191	1.29	8.0
3. Diseases of circulatory system.....	18,784	2.16	13.4
4. Diseases of respiratory system.....	20,829	2.40	14.9
5. Diseases of digestive system.....	16,664	1.91	11.9
6. Diseases of genito-urinary system.....	12,196	1.40	8.7
7. The puerperal state.....	1,333	0.15	.95
8. Diseases of skin and cellular tissue.....	649	0.07	.46
9. Diseases of organs of locomotion.....	290	0.03	.21
10. Malformations.....	1,200	0.14	.85
11. Early infancy.....	3,539	0.41	2.52
12. Old age.....	2,189	0.25	1.6
13. External causes.....	9,232	1.06	6.6
14. Ill-defined causes.....	1,147	0.13	0.8
Total deaths from all causes.....	140,261	16.1	100.0

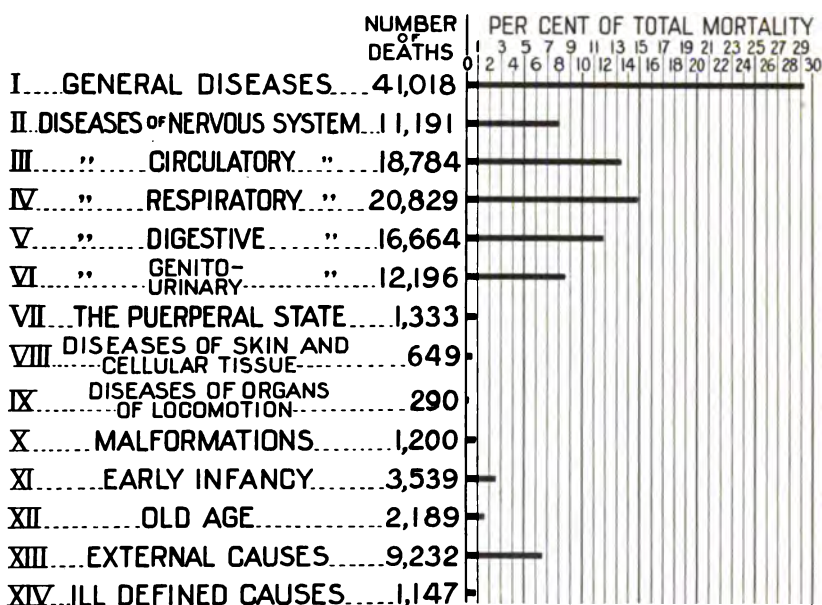
The Following Shows the Seasonal Fatality from the Chief Causes of Death During 1909:

MONTH	Jan.	Feb.	Mar.	April	May	June
Tuberculosis of lungs.....	1,169	1,153	1,362	1,399	1,258	1,142
Violence.....	583	554	681	758	751	916
Pneumonia.....	983	983	1,287	1,265	900	538
Bright's disease.....	724	754	920	851	818	807
Cancer.....	535	522	588	567	578	583
Diphtheria.....	251	238	246	242	212	179
Scarlet fever.....	132	116	147	113	165	110
Typhoid fever.....	101	74	77	55	80	70
Measles.....	79	112	141	195	159	152
Total mortality in State from all causes.....	11,486	11,011	13,114	12,828	12,147	10,712

Seasonal Fatality from the Chief Causes of Death — Continued

MONTH	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Tuberculosis of lungs..	1,128	1,039	958	1,089	1,090	1,209	13,996
Violence.....	914	884	812	809	761	809	9,232
Pneumonia.....	329	262	374	589	773	1,130	9,423
Bright's disease.....	682	675	665	774	783	940	9,393
Cancer.....	598	577	621	618	601	672	7,060
Diphtheria.....	132	103	98	138	208	266	2,313
Scarlet fever.....	65	32	48	44	90	143	1,205
Typhoid fever.....	85	129	183	183	157	121	1,315
Measles.....	126	63	30	36	58	121	1,272
Total mortality in State from all causes.....	11,210	11,617	11,067	11,450	10,884	12,726	140,261

DEATH RATE AND PER CENT OF DEATHS FROM DIFFERENT CAUSES. NEW YORK STATE 1909.

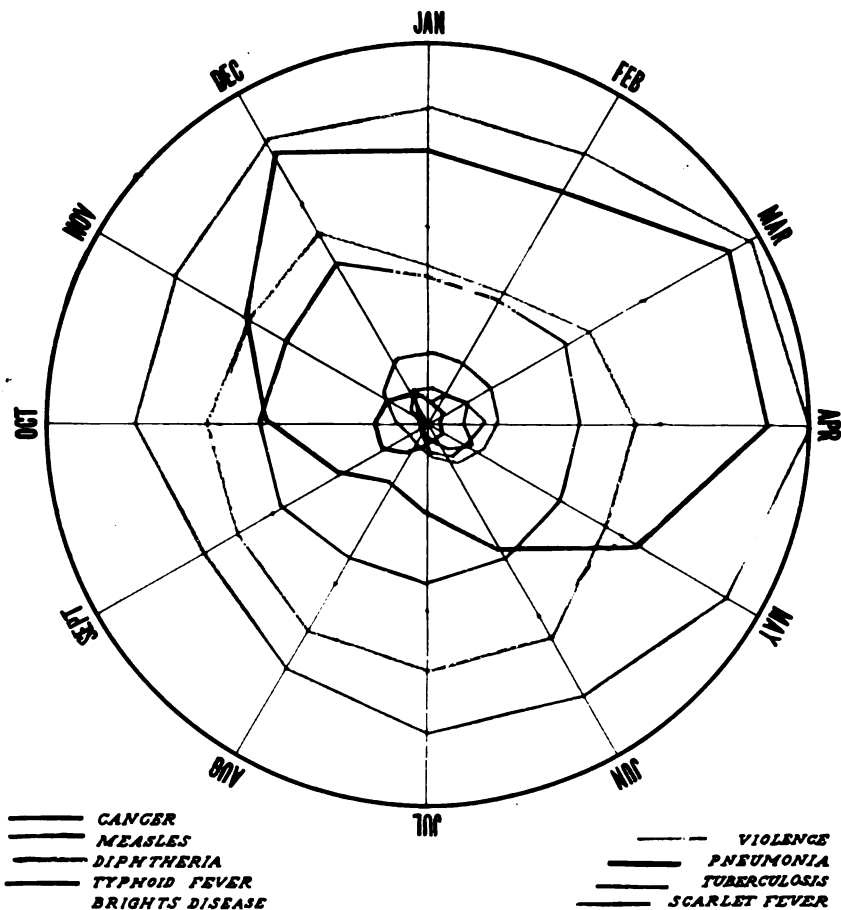


TOTAL DEATHS 140,261
FROM ALL CAUSES.

NEW YORK STATE DEPARTMENT OF HEALTH



THE FOLLOWING SHOWS THE
SEASONAL FATALITY
 FROM THE
CHIEF CAUSES OF DEATH
DURING 1909



Deaths Per 100,000 Population—City and Rural from—

	Pulmon- ary tubercu- losis	Bright's disease	Pneu- monia
Greater New York.....	194.2	109.0	117.9
Buffalo.....	131.9	59.5	57.8
Cities between 100,000 and 200,000 population.....	141.1	120.0	88.9
Cities between 50,000 and 100,000 population.....	167.2	98.0	116.0
Cities between 20,000 and 50,000 population.....	121.8	113.5	110.1
Cities between 10,000 and 20,000 population.....	105.6	100.8	106.2
Cities under 10,000 population.....	106.9	104.1	123.8
Rural mortality.....	121.1	113.4	101.1

Deaths Per 100,000 Population—City and Rural from—

	Cancer	Typhoid	Diph- theria	Scarlet fever
Greater New York.....	78.3	12.7	38.5	17.7
Buffalo.....	68.3	24.2	25.7	42.4
Cities between 100,000 and 200,000 population.....	95.5	11.8	15.4	9.2
Cities between 50,000 and 100,000 population.....	75.7	14.0	13.4	17.8
Cities between 20,000 and 50,000 population.....	78.0	31.3	21.8	5.6
Cities between 10,000 and 20,000 population.....	79.0	21.6	14.3	7.0
Cities under 10,000 population.....	109.7	31.0	16.7	2.8
Rural mortality.....	87.1	14.9	10.5	4.7

The Following Table Shows the Total Death Rate from

COUNTY	Popula- tion	TYPHOID FEVER		DIPHTHERIA	
		Number of deaths	Rate per 100,000 population	Number of deaths	Rate per 100,000 population
Albany.....	176,237	42	23.8	31	17.6
Allegany.....	44,661	12	26.9	1	2.2
Broome.....	74,786	11	14.7	21	28.1
Cattaraugus.....	66,636	13	19.5	5	7.5
Cayuga.....	65,309	9	13.8	3	4.6
Chautauqua.....	103,532	15	14.5	35	33.8
Chemung.....	51,600	18	34.9	3	5.8
Chenango.....	36,955	7	18.9	3	8.1
Clinton.....	47,282	4	8.5	3	6.3
Columbia.....	42,868	7	16.3	1	2.3
Cortland.....	31,043	5	16.1	0	0.0
Delaware.....	47,088	5	10.6	4	8.5
Dutchess.....	81,633	11	13.5	16	19.6
Erie.....	505,708	111	21.9	117	23.1
Essex.....	33,848	6	17.7	3	8.9
Franklin.....	50,336	12	23.8	2	4.0
Fulton.....	42,330	3	7.1	13	30.7
Genesee.....	36,930	4	10.8	7	19.0
Greene.....	31,130	8	25.7	4	12.8
Hamilton.....	4,912	0	0.0	1	20.4
Herkimer.....	56,100	6	10.7	5	8.9
Jefferson.....	83,427	22	26.4	2	2.4
Lewis.....	26,643	6	22.5	0	0.0
Livingston.....	36,450	3	8.1	1	2.7
Madison.....	39,690	1	2.5	1	2.5
Monroe.....	256,698	22	8.6	31	12.1
Montgomery.....	51,848	4	7.7	9	17.3
Nassau.....	80,892	11	13.6	25	31.0
New York city.....	4,450,963	564	12.7	1,715	38.5
Niagara.....	92,568	45	48.6	20	21.6
Oneida.....	144,573	27	18.6	14	10.0
Onondaga.....	186,205	27	14.5	31	11.3
Ontario.....	55,153	6	10.9	3	5.4
Orange.....	111,791	31	27.7	17	15.2
Orleans.....	32,247	2	6.2	1	3.1
Oswego.....	70,110	12	17.0	2	2.9
Otsego.....	48,209	14	29.0	3	6.2
Putnam.....	14,473	0	0.0	1	7.0
Rensselaer.....	134,537	30	22.3	8	6.0
Rockland.....	50,406	4	7.9	10	20.0
St. Lawrence.....	90,813	15	16.5	11	12.1
Saratoga.....	63,910	10	15.6	3	4.7
Schenectady.....	82,918	8	9.7	8	9.7
Schoharie.....	25,294	5	20.0	1	4.0
Schuyler.....	15,122	2	13.2	0	0.0
Seneca.....	25,315	4	15.8	4	15.8
Steuben.....	81,814	29	35.4	2	2.4
Suffolk.....	84,909	10	11.8	15	17.0
Sullivan.....	36,788	9	24.5	1	2.7
Tioga.....	26,907	3	11.1	4	14.9
Tompkins.....	34,307	6	17.5	7	20.4
Ulster.....	86,660	13	15.0	17	20.0
Warren.....	33,527	5	15.0	1	3.0
Washington.....	48,776	10	20.5	9	18.5
Wayne.....	48,564	8	16.5	6	12.3
Westchester.....	264,702	28	10.6	52	20.0
Wyoming.....	32,107	3	10.0	0	0.0
Yates.....	19,408	7	36.0	0	0.0

Death rates from tuberculosis by county are given on p. 207.

Principal Causes of Death in the Counties of the State

COUNTY	DIARRHEA		INFLUENZA		CANCER	
	Number of deaths	Rate per 100,000 population	Number of deaths	Rate per 100,000 population	Number of deaths	Rate per 100,000 population
Albany	128	72.6	22	12.5	171	97.0
Allegany	15	33.6	14	31.3	33	73.9
Broome	33	44.1	17	22.7	63	84.2
Cattaraugus	21	31.5	15	22.5	63	84.5
Cayuga	49	75.0	16	24.5	73	111.8
Chautauqua	38	36.7	30	29.0	88	85.0
Chemung	17	32.9	13	25.2	43	83.3
Chemango	11	29.8	15	40.6	35	94.7
Clinton	39	82.5	20	42.3	33	69.8
Columbia	27	63.0	4	9.3	35	81.6
Corland	5	16.1	9	29.0	27	87.0
Delaware	14	29.7	12	25.5	40	84.9
Dutchess	56	68.6	8	9.8	86	105.3
Erle	358	70.8	41	8.1	333	65.8
Essex	27	79.8	7	20.7	20	59.1
Franklin	43	85.4	12	23.8	35	69.5
Fulton	4	9.4	8	18.9	58	137.0
Genesee	16	43.3	13	35.2	16	43.3
Greene	8	25.7	4	12.8	29	96.4
Hamilton	0	0.0	0	0.0	5	101.8
Herkimer	40	71.3	5	8.9	41	73.1
Jefferson	27	32.4	22	26.4	66	79.0
Lewis	4	15.0	10	37.5	13	48.8
Livingston	13	35.6	8	21.9	29	79.5
Madison	11	27.7	12	30.2	35	88.2
Monroe	233	94.6	14	54.5	212	82.5
Montgomery	55	106.8	4	7.7	52	100.2
Nassau	60	74.2	8	10.0	51	63.0
New York city	5,138	115.4	334	7.5	3,487	78.3
Niagara	72	77.7	18	19.4	56	60.0
Oneida	136	94.1	28	19.4	113	78.1
Onondaga	167	90.0	35	18.8	171	91.8
Ontario	11	20.0	16	29.0	45	81.6
Orange	57	50.9	26	23.3	73	65.3
Orleans	15	46.5	6	18.6	27	83.7
Oswego	34	48.5	27	38.5	56	80.0
Otsego	11	22.8	13	27.0	55	111.4
Putnam	5	34.5	3	20.7	16	111.0
Rensselaer	65	48.3	28	20.8	131	97.3
Rockland	31	61.5	5	9.9	38	75.4
St. Lawrence	50	55.1	12	13.2	88	96.9
Saratoga	33	51.6	20	31.2	63	98.6
Schenectady	80	96.5	8	9.6	37	44.6
Schoharie	9	35.7	4	15.8	33	130.4
Schuyler	1	6.6	3	19.8	24	159.0
Seneca	8	31.6	5	19.8	30	118.4
Steuben	25	30.6	17	20.7	97	118.5
Suffolk	46	54.2	21	24.7	80	94.2
Sullivan	15	40.8	10	27.1	20	54.3
Tioga	3	11.2	14	52.0	25	92.9
Tompkins	11	32.0	13	37.9	43	125.3
Ulster	50	57.7	26	30.0	78	80.0
Warren	11	32.8	4	11.9	36	107.3
Washington	44	90.2	13	26.7	45	92.2
Wayne	20	41.2	13	26.8	49	101.0
Westchester	354	133.7	20	7.6	223	84.2
Wyoming	14	43.6	11	34.2	27	84.1
Yates	5	25.8	6	30.9	9	46.2

MORTALITY FROM PRINCIPAL CAUSES

CITY	Population	ALL CAUSES		TYPHOID FEVER		PULMONARY TUBERCULOSIS		CANCER	
		Total Deaths	Rate per 1,000 population	Deaths	Rate per 100,000 population	Deaths	Rate per 100,000 population	Deaths	Rate per 100,000 population
Rome.....	18,917	382	20.2	3	16.0	21	111.0	19	100.4
Cohoes.....	24,185	488	20.1	20	82.2	59	244.0	18	74.4
Kingston.....	26,110	519	19.8	8	30.6	62	237.4	22	84.3
Troy.....	77,242	1,487	19.2	17	22.0	185	239.5	94	121.7
Poughkeepsie.....	26,039	501	19.2	6	23.0	34	130.5	38	145.9
Port Jervis.....	9,943	183	18.4	2	20.1	8	80.4	8	80.5
Newburgh.....	27,418	482	17.5	13	47.4	45	165.8	17	62.0
Albany.....	100,730	1,759	17.4	19	18.8	170	168.7	118	117.0
Plattsburgh.....	11,450	199	17.3	3	26.2	16	139.7	12	104.8
Oneonta.....	8,794	152	17.2	7	79.6	11	125.1	7	79.6
Amsterdam.....	25,267	423	16.7	3	11.9	38	150.3	25	98.9
Utica.....	69,458	1,153	16.6	11	15.8	111	159.8	53	76.3
New York.....	4,450,963	74,105	16.6	564	12.7	8,645	194.2	3,487	78.3
Manhattan.....	2,305,196	37,961	16.4	262	11.4	4,206	182.4	1,827	79.3
Bronx.....	328,460	6,426	19.5	63	19.2	1,623	494.1	295	89.8
Brooklyn.....	1,505,925	24,365	16.1	191	12.7	2,348	156.0	1,110	73.7
Queens.....	233,709	3,838	16.4	37	15.8	309	132.2	170	72.4
Richmond.....	77,673	1,515	19.5	11	14.2	159	204.7	85	109.4
Ogdensburg.....	14,921	245	16.4	4	26.8	17	114.0	18	120.6
Johnstown.....	9,473	155	16.3	0	0	10	105.5	18	190.0
Gloversville.....	18,761	300	16.0	2	10.7	22	117.2	21	112.4
Little Falls.....	11,563	183	15.8	1	8.6	18	155.6	9	77.8
Watervliet.....	14,609	230	15.7	1	6.8	29	198.5	7	47.9
Hudson.....	11,032	172	15.6	1	9.1	14	126.9	10	90.6
Yonkers.....	72,200	1,125	15.5	5	6.9	107	148.2	43	59.6
Syracuse.....	125,378	1,947	15.5	14	11.1	145	115.6	114	90.9
Binghamton.....	45,855	712	15.5	6	13.1	36	78.5	30	65.4
Middletown.....	16,610	256	15.4	3	18.1	20	120.4	12	72.2
Buffalo.....	396,535	6,111	15.4	96	24.2	523	131.8	271	68.3
Elmira.....	35,765	546	15.3	12	33.5	34	97.8	25	70.0
Lockport.....	18,105	276	15.2	9	49.7	23	127.3	15	82.9
Watertown.....	28,140	423	15.0	11	39.0	30	106.6	21	74.6
Oswego.....	22,528	336	14.9	6	26.6	22	97.6	23	102.1
Rochester.....	196,793	2,913	14.8	17	8.6	282	143.3	172	87.4
North Tonawanda.....	10,967	162	14.7	6	55.6	8	72.9	10	91.0
Niagara Falls.....	32,012	465	14.5	24	74.9	34	106.2	10	31.2
Auburn.....	34,272	499	14.5	6	17.5	34	99.2	31	90.4
Tonawanda.....	7,315	105	14.3	2	27.3	9	123.0	6	82.0
Fulton.....	11,759	167	14.2	0	0	8	68.0	2	17.0
Corning.....	15,339	217	14.1	19	123.9	12	78.0	9	58.7
Mt. Vernon.....	27,891	362	14.0	2	7.2	29	104.0	21	75.2
Glens Falls.....	16,279	226	13.8	1	6.1	24	147.4	17	104.4
Oneida.....	10,099	139	13.7	0	0	5	49.5	10	99.0
Ithaca.....	15,584	211	13.5	3	19.2	13	83.4	14	89.8
Lackawanna.....	11,370	150	13.1	0	0	22	193.5	1	8.8
Hornell.....	14,126	185	13.1	3	21.2	12	95.0	9	63.7
Rensselaer.....	13,368	174	13.0	4	29.9	12	89.8	12	89.8
New Rochelle.....	24,920	323	12.9	6	24.1	23	92.2	13	52.2
Geneva.....	13,543	175	12.9	2	14.7	15	110.7	7	51.7
Cortland.....	12,538	162	12.9	3	23.9	6	47.8	8	63.8
Jamestown.....	28,495	343	12.0	5	17.5	18	63.2	25	87.7
Olean.....	18,000	211	11.7	2	11.1	9	50.0	12	66.7
Schmectady.....	73,087	846	11.5	8	10.9	86	117.7	31	42.4
Dunkirk.....	18,061	202	11.1	2	11.1	10	55.3	12	66.4

IN THE CITIES OF THE STATE

DISEASES OF THE CIRCULATORY SYSTEM		PNEUMONIA		OTHER RESPIRATORY DISEASES		CHRONIC BRONCHITIS		DIARRHEA ENTERITIS (Under 2 years)		VIOLENCE (Accidents, suicides, etc.)	
Deaths	Rate per 100,000 population	Deaths	Rate per 100,000 population	Deaths	Rate per 100,000 population	Deaths	Rate per 100,000 population	Deaths	Rate per 100,000 population	Deaths	Rate per 100,000 population
63	333.0	22	116.3	10	52.9	29	153.3	16	84.6	29	153.3
33	136.4	26	107.5	43	177.8	25	103.3	47	194.3	27	111.6
60	264.2	42	160.8	30	76.6	26	99.5	12	46.0	38	145.5
202	261.5	96	126.8	63	81.6	101	130.8	48	62.3	71	91.9
72	276.5	36	138.0	23	88.3	34	130.5	20	76.8	34	130.5
24	241.4	25	251.4	9	90.5	15	150.8	3	30.2	16	160.9
52	189.6	41	149.5	25	91.2	46	167.7	13	47.4	29	105.7
287	284.9	80	79.4	79	78.4	145	144.0	54	53.6	104	103.2
18	157.2	12	104.8	14	122.2	5	43.7	17	148.5	12	104.8
19	216.1	5	56.8	8	91.0	9	102.3	5	56.8	9	102.3
40	158.3	32	126.6	17	67.2	25	96.9	50	197.8	28	110.8
104	149.7	80	115.1	67	96.5	78	112.3	91	131.0	78	112.3
10,137	237.7	5,249	117.9	7,502	168.5	4,853	109.0	5,138	115.4	4,799	107.8
4,830	209.5	2,566	111.3	4,204	182.3	2,342	101.6	2,547	110.5	2,555	110.8
4,858	261.2	882	116.2	407	123.9	346	106.3	304	92.6	373	113.5
3,657	242.8	1,921	127.5	2,429	161.2	1,759	116.8	1,825	121.2	1,460	97.0
597	255.4	279	119.0	363	155.3	258	110.4	351	150.1	304	130.1
195	251.1	101	130.0	99	127.4	148	190.5	111	143.0	107	138.0
34	227.8	18	120.6	18	120.6	10	67.0	9	60.3	12	80.4
26	274.5	9	95.0	8	84.5	11	116.1	1	10.6	3	31.7
36	192.0	18	95.9	17	90.6	28	149.2	2	10.7	25	133.2
17	147.0	14	121.1	7	60.5	6	51.9	14	121.1	23	196.9
25	171.1	23	167.4	21	143.7	8	54.8	14	95.8	9	61.6
19	172.2	11	99.7	5	45.3	18	163.1	15	136.0	11	99.7
125	173.1	98	135.7	109	150.9	45	62.3	141	195.2	77	106.7
274	218.5	118	94.1	76	60.6	133	106.0	136	108.4	129	102.9
79	172.2	58	126.4	30	65.4	58	126.4	25	51.2	59	128.6
29	174.6	13	78.3	7	42.1	27	162.6	6	36.1	24	144.5
799	201.4	228	57.5	608	153.3	286	59.5	240	60.5	378	95.3
79	220.8	30	83.8	35	97.8	67	187.3	14	39.1	38	106.2
23	127.0	20	110.4	17	93.9	10	55.2	6	33.1	28	154.7
58	206.1	21	74.6	24	85.2	12	42.6	13	46.2	32	114.0
33	146.4	22	97.6	9	44.3	23	102.1	17	75.4	21	93.2
377	191.5	178	90.4	196	99.5	229	116.3	179	90.9	186	94.5
16	145.6	18	163.8	11	100.1	4	36.4	12	109.2	16	145.6
41	128.1	40	124.9	25	78.1	20	62.5	41	128.0	53	165.6
66	192.5	29	84.6	25	72.9	34	99.2	42	122.5	27	78.7
20	273.4	5	68.4	3	41.0	2	27.3	3	41.0	8	109.4
23	195.6	14	119.1	5	42.5	13	110.6	9	76.5	10	85.0
30	195.6	19	123.9	10	65.2	11	71.7	7	45.6	17	110.8
32	114.7	22	78.9	29	104.0	40	143.4	35	125.5	26	93.2
24	147.4	11	67.6	9	55.3	12	73.7	6	36.9	18	110.6
94	237.6	15	148.5	5	49.5	4	39.6	2	19.8	11	108.9
27	173.3	10	64.2	6	38.5	28	179.7	6	38.5	11	70.6
7	61.6	12	105.5	6	52.8	1	8.8	48	422.2	14	123.1
34	240.7	10	70.8	7	49.6	10	70.8	1	7.1	17	120.3
25	187.0	13	97.2	9	67.3	11	82.3	7	52.4	17	127.2
23	92.2	23	92.2	33	132.4	31	124.4	24	96.3	23	92.2
25	184.6	19	140.3	8	59.1	9	66.5	4	29.5	16	118.1
20	159.5	12	95.7	5	39.9	25	199.4	1	8.0	17	135.6
33	115.8	28	98.2	15	52.6	23	80.7	10	35.1	21	73.7
16	88.9	16	88.9	8	44.4	11	61.1	9	50.0	21	116.7
76	104.0	60	82.2	54	73.9	62	84.9	75	102.7	54	73.9
28	155.0	16	88.6	7	38.8	11	60.9	7	38.7	21	116.3

Summary of Mortality of the State of New York for the Year 1909

TOTAL MORTALITY BY MONTHS

	Total deaths	Annual death rate per 1,000 population	AGES					
			Deaths under 1 year	Deaths 1 to 4 years	Deaths 5 to 19 years	Deaths 20 to 39 years	Deaths 40 to 59 years	Deaths at 60 years and over
January.....	11,486	15.8	1,974	935	589	1,776	2,421	3,789
February.....	11,011	15.2	1,893	974	571	1,709	2,270	3,591
March.....	13,114	18.1	2,150	1,118	739	2,030	2,769	4,365
April.....	12,828	17.7	2,050	1,211	690	2,098	2,682	4,097
May.....	12,147	16.7	1,946	1,147	689	2,085	2,451	3,805
June.....	10,712	14.8	1,712	979	642	1,826	2,291	3,255
July.....	11,210	15.5	2,028	1,065	670	1,783	2,111	2,946
August.....	11,617	16.0	3,206	1,080	639	1,713	1,961	2,948
September.....	11,067	15.3	2,698	1,025	553	1,687	2,004	3,082
October.....	11,459	15.8	2,114	902	621	1,843	2,340	3,629
November.....	10,884	15.0	1,694	811	580	1,880	2,393	3,515
December.....	12,726	17.6	1,952	954	681	2,089	2,766	4,276
Total.....	140,261	16.1	26,077	12,201	7,662	22,519	28,379	43,296
Total for 1908.....	138,912	16.3	26,561	11,380	.....	.....	.....	41,493

TOTAL MORTALITY BY MONTHS

	EPIDEMIC DISEASES									
	Typhoid fever	Malarial diseases	Small-pox	Measles	Scarlatina	Whooping cough	Diphtheria and croup	Influenza	Erysipelas	Cerebro-spinal meningitis
January.....	101	9	.....	79	132	31	251	126	42	12
February.....	74	3	1	112	116	43	238	126	52	43
March.....	77	7	1	141	147	65	246	248	79	49
April.....	55	5	1	195	113	77	242	247	52	46
May.....	80	6	.....	159	165	101	212	117	44	51
June.....	70	4	.....	152	110	60	179	44	42	41
July.....	85	7	.....	126	65	94	132	12	29	43
August.....	129	7	.....	63	32	89	103	8	16	44
September.....	183	8	.....	30	48	85	98	18	26	46
October.....	183	10	1	36	44	59	138	26	19	35
November.....	157	10	.....	58	90	38	208	42	31	24
December.....	121	2	.....	121	143	41	266	108	40	31
Total.....	1,315	78	4	1,272	1,205	783	2,313	1,122	472	485
Total for 1908.....	1,375	84	3	1,175	1,088	503	2,473	1,595	419	539

TOTAL MORTALITY BY MONTHS

	Pul- monary tuber- culosis	Cancer	Other general diseases	Diseases of the nervous system	Diseases of the circula- tory system	Pneu- monia	Other diseases of the respi- ratory system	Diar- rhea and enteritis (under 2 years)	Other diseases of the diges- tive system	Bright's disease	Other diseases of the genito- urinary system
January.....	1,169	535	1,039	948	1,752	993	1,235	199	626	724	255
February.....	1,153	522	1,005	890	1,551	983	1,101	204	651	754	225
March.....	1,362	588	829	997	1,827	1,287	1,350	229	683	920	266
April.....	1,399	567	869	999	1,621	1,265	1,357	264	623	851	260
May.....	1,258	578	1,192	1,044	1,629	900	1,035	301	755	818	250
June.....	1,142	583	1,085	881	1,434	538	749	359	609	807	238
July.....	1,128	598	846	852	1,315	329	592	1,470	770	682	215
August.....	1,039	577	840	796	1,332	262	528	2,084	869	675	204
September.....	958	621	799	823	1,279	374	552	1,466	922	665	185
October.....	1,089	618	777	992	1,626	589	784	782	869	774	245
November.....	1,090	601	801	920	1,556	773	856	303	672	783	223
December.....	1,209	672	831	1,069	1,862	1,130	1,267	212	684	940	237
Total.....	13,996	7,000	10,913	11,191	18,784	9,423	11,406	7,873	8,791	9,393	2,803
Total for 1908.	14,347	6,554	7,511	11,989	17,233	8,628	9,849	9,111	8,398	8,512	2,817

TOTAL MORTALITY BY MONTHS

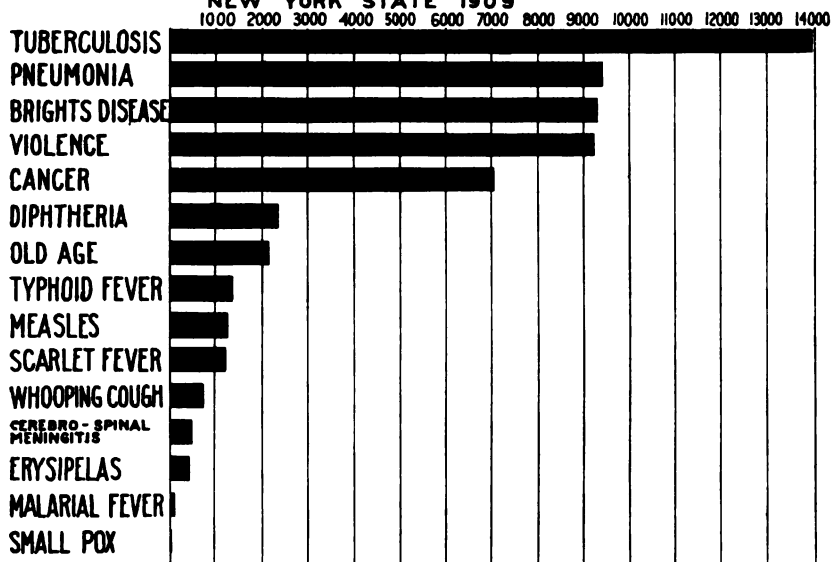
	The puer- peral state	Diseases of the skin	Diseases of the organs of loco- motion	Malform- ations	Early infancy (under 3 months)	External causes	Ill- defined diseases	Births		
								Total births	Annual birth rate per 1,000 popu- lation	Still births
January.....	119	53	19	104	116	583	234	16,389	22.6	1,133
February.....	112	58	23	76	102	554	240	15,066	20.8	797
March.....	136	52	21	111	406	681	309	16,902	23.3	871
April.....	132	55	22	95	372	758	286	15,069	20.8	832
May.....	116	55	36	113	99	751	282	14,974	20.7	827
June.....	97	64	38	83	106	916	222	16,277	22.4	781
July.....	122	57	31	76	359	914	261	17,590	24.3	816
August.....	97	46	17	121	460	884	295	16,970	23.4	743
September.....	102	57	22	95	416	812	377	16,894	23.2	803
October.....	96	65	18	106	384	809	285	17,306	23.9	783
November.....	92	34	21	101	355	761	284	17,007	23.5	820
December.....	112	53	22	119	364	809	261	22,212	30.6	863
Total.....	1,333	649	290	1,200	3,539	9,232	3,336	202,656	23.3	10,069
Total for 1908.	1,335	500	254	1,137	7,091	9,183	4,549	203,159	23.8	10,546

*Detailed Statement as to Causes of Deaths Occurring in the State
During 1909*

	Jan.	Feb.	Mar.	April	May	June	July
I. GENERAL DISEASES							
(A.) Epidemic Diseases							
Typhoid fever.....	101	74	77	55	80	70	85
Exanthematic typhus.....							
Relapsing fever.....							
Malarial fever.....	9	3	7	5	6	4	7
Smallpox.....		1	1	1			
Measles.....	79	112	141	195	159	152	126
Scarlet fever.....	132	116	147	113	165	110	65
Whooping cough.....	31	43	65	77	101	60	94
(a) Diphtheria.....	240	229	238	236	202	176	127
(b) Croup.....	11	9	8	6	10	3	5
Influenza.....	126	126	248	247	117	44	12
Miliary fever.....							
Asiatic cholera.....							
*Cholera infantum.....	1	7	3	11	10	25	182
Dysentery.....	6	1	6	13	5	11	25
Plague.....							
Yellow fever.....							
Leprosy.....							
Erysipelas.....	42	52	79	52	44	42	29
Other general diseases.....	4	6	4	7	6	6	12
(B.) Other General Diseases							
Septicæmia.....	35	26	32	34	36	25	27
Glanders and farcy.....			1	1		1	
Malignant pustule and charbon.....							
Rabies.....			2			1	1
Actinomycosis, trichinosis, etc.....		2		1			
Pellagra.....							
Tuberculosis of lungs.....	1,169	1,153	1,362	1,399	1,258	1,142	1,128
Tuberculosis of larynx.....	6	17	11	7	15	7	13
Tuberculous meningitis.....	81	99	100	122	106	92	105
Abdominal tuberculosis.....	28	24	41	26	35	42	33
Pott's disease.....	7	10	11	7	7	3	12
Tuberculous abscess.....	12		1	3	1	1	
White swelling.....	3	2	7	2	5	1	3
Tuberculosis of other organs.....	10	12	14	17	21	19	21
General tuberculosis.....	20	13	12	14	12	19	15
Scrofula.....				1			
Syphilis.....	53	44	58	46	45	50	45
Gonorrhea of the adult.....	3				1	3	3
Gonorrheal infections of children.....				3	1	1	
Cancer of mouth.....	24	21	20	22	23	29	25
Cancer of stomach and liver.....	188	214	214	215	224	198	245
Cancer of intestines and peritoneum.....	58	68	75	72	74	77	69
Cancer of skin.....	18	12	23	11	20	21	12
Cancer of breast.....	52	43	56	62	43	55	58
Cancer of female genital organs.....	101	75	99	88	82	97	94
Cancer of other or unspecified organs.....	94	89	101	97	112	106	95
Tumor (noncancerous).....	13	16	10	10	20	14	18
Acute articular rheumatism.....	51	53	62	62	67	49	43
Chronic rheumatism and gout.....	45	39	42	43	41	50	30
Scurvy.....	1		1	3		1	4
Diabetes.....	115	116	111	116	120	103	114
Exophthalmic goiter.....	8	6	15	10	18	9	13
Addison's disease.....	3		6	6		7	3
Leukæmia.....	13	10	11	13	13	11	11
Anæmia, chlorosis.....	31	38	51	48	49	44	38
Alcoholism.....	57	49	65	75	72	66	53
Lead poisoning.....	1	1			6	1	2
Other professional intoxications.....			5		10	1	4
Other chronic poisonings.....		2	2		1		2
II. NERVOUS SYSTEM							
Encephalitis.....	4	2	4	3	7	7	2
Meningitis.....	79	89	105	89	108	92	83
Cerebrospinal meningitis.....	32	43	49	46	51	41	43
Locomotor ataxia.....	20	13	9	14	8	8	20
Other diseases of spinal cord.....	38	32	27	27	41	41	36
Apoplexy.....	435	420	500	469	468	390	400

* Of these 20 were over 2 years of age.

**COMPARATIVE MORTALITY
FIFTEEN PROMINENT CAUSES OF DEATH.
NEW YORK STATE 1909**



NEW YORK STATE DEPARTMENT OF HEALTH

	Aug.	Sept.	Oct.	Nov.	Dec.	Total
I. GENERAL DISEASES						
(A) Epidemic Diseases						
Typhoid fever	129	183	183	157	121	1,315
Exanthematic typhus						
Relapsing fever						
Malarial fever	7	8	10	10	2	78
Smallpox			1			4
Measles	63	30	36	58	121	1,272
Scarlet fever	32	48	44	90	143	1,205
Whooping cough	89	85	59	38	41	783
(a) Diphtheria	100	94	128	190	251	2,211
(b) Croup	3	4	10	18	15	102
Influenza	8	18	26	42	108	1,122
Miliary fever						
Asiatic cholera						
Cholera infantum	402	312	106	20	13	1,092
Dysentery	97	77	46	19	8	314
Plague						
Yellow fever						
Leprosy				1		1
Erysipelas	16	26	19	31	40	472
Other general diseases	20	12	13	3	15	108
(B) Other General Diseases						
Septicæmia	18	14	21	14	30	312
Glanders and farcy						3
Malignant pustule and charbon	1	1		1	2	5
Rabies		1		2	1	8
Actinomycosis, trichinosis, etc.		1	2	1	1	8
Pellagra						
Tuberculosis of lungs	1,039	958	1,089	1,090	1,209	13,996
Tuberculosis of larynx	9	9	6	8	19	127
Tuberculous meningitis	106	78	72	66	86	1,113
Abdominal tuberculosis	22	41	36	31	31	390
Pott's disease	5	9	5	7	5	92
Tuberculous abscess		1	3	1	2	27
White swelling	3	5	3	3	4	41
Tuberculosis of other organs	10	8	9	13	12	166
General tuberculosis	8	16	16	14	6	165
Scrofula				1	1	3
Syphilis	37	49	34	53	51	565
Gonorrhea of the adult	2	1	2		1	16
Gonorrheal infections of children		3	3	1	2	15
Cancer of mouth	16	17	16	31	23	267
Cancer of stomach and liver	210	244	227	241	257	2,677
Cancer of intestines and peritoneum	85	88	84	76	100	926
Cancer of skin	16	16	16	12	25	202
Cancer of breast	44	61	63	65	63	665
Cancer of female genital organs	108	93	109	89	111	1,146
Cancer of other or unspecified organs	98	102	103	87	93	1,177
Tumor (noncancerous)	11	7	7	6	7	139
Acute articular rheumatism	39	33	31	57	40	587
Chronic rheumatism and gout	37	39	36	34	56	483
Scurvy	2	2	1		1	17
Diabetes	92	103	122	115	124	135
Exophthalmic goiter	5	6	7	10	9	116
Addison's disease	3	6	4	3	2	47
Leukemia	15	13	7	9	20	146
Anemia, chlorosis	48	27	34	43	37	488
Alcoholism	66	75	76	83	80	817
Lead poisoning	2	2	1	4	2	22
Other professional intoxications						20
Other chronic poisonings	4	1	9		6	27
II. NERVOUS SYSTEM						
Encephalitis	5	6	4	3	7	54
Meningitis	81	97	95	79	87	1,084
Cerebrospinal meningitis	44	46	35	24	31	485
Locomotor ataxia	18	13	11	15	22	164
Other diseases of spinal cord	40	70	79	54	52	537
Apoplexy	384	358	448	451	519	5,239

	Jan.	Feb.	Mar.	April	May	June	July
II. NERVOUS SYSTEM—(Continued)							
Softening of brain.....	17	30	21	15	27	18	12
Paralysis.....	112	93	93	89	101	82	92
General paralysis of insane.....	45	21	43	41	44	46	36
Other forms of mental disease.....	11	13	10	16	16	22	6
Other diseases of brain.....	.....	.....	2	1	4	2	.....
Epilepsy.....	21	30	35	36	40	35	33
Convulsions (nonpuerperal).....	3	.....	2	.....	.....	.....	.....
Convulsions of children.....	85	61	69	108	70	58	49
Tetanus.....	5	4	6	5	9	16	21
Chorea.....	1	2	1	3	4	1	2
Other diseases of nervous system.....	34	47	44	53	64	50	50
Diseases of the eye and its adnexa.....	2	.....	.....	1	2	1	1
Diseases of the ear.....	16	33	26	22	25	12	9
III. CIRCULATORY SYSTEM							
Pericarditis.....	21	10	8	21	15	8	13
Endocarditis.....	166	153	193	177	219	185	191
Heart disease.....	1,106	997	1,172	1,024	953	880	794
Angina pectoris.....	58	39	47	40	62	42	55
Diseases of arteries.....	321	280	308	286	296	253	197
Embolism and thrombosis.....	38	37	54	39	48	30	29
Diseases of veins.....	5	10	16	3	9	4	4
Diseases of lymphatics.....	1	1	2	8	2	3	1
Hemorrhages (except of lungs).....	18	11	11	11	14	11	6
Other diseases of circulatory system.....	18	13	16	12	11	18	25
IV. RESPIRATORY SYSTEM							
Diseases of nasal fossae.....	1	2	1	.....	.....	2	1
(a) Laryngitis.....	11	4	8	9	2	6	1
(b) Other diseases of larynx.....	6	8	6	5	5	1	2
Diseases of the thyroid body.....	1	1	2	1	3	1	1
Acute bronchitis.....	211	154	198	186	140	67	57
Chronic bronchitis.....	70	71	109	99	91	60	48
Bronchopneumonia.....	775	704	879	862	663	485	359
Pneumonia.....	993	983	1,287	1,265	900	538	329
Pleurisy.....	48	48	63	57	53	45	37
Congestion of lungs.....	41	34	41	38	26	23	15
Gangrene of lungs.....	.....	2	2	9	8	3	5
Asthma.....	24	23	18	33	18	20	28
Emphysema.....	17	7	5	8	8	3	5
(a) Hemorrhage of lungs.....	4	3	1	8	2	4	4
(b) Other diseases of respiratory system.....	26	40	17	41	16	29	29
V. DIGESTIVE SYSTEM							
Diseases of mouth.....	3	1	2	4	4	3	2
(a) Tonsillitis.....	6	4	3	3	2	3	3
(b) Diseases of pharynx.....	8	9	17	13	8	8	4
Diseases of esophagus.....	1	2	2	2	2	2	1
Ulcer of stomach.....	18	25	23	34	34	36	27
Gastritis.....	26	41	31	24	47	32	37
(b) Other diseases of stomach.....	65	65	66	62	82	58	65
Dentition.....	.....	4	3	1	3	3	1
Diarrhea and enteritis (under 2 yrs.).....	198	197	226	253	291	334	1,291
Diarrhea and enteritis (2 yrs. and over).....	48	69	63	67	85	72	162
Intestinal parasites.....	1	1	.....	1	1	.....	1
(a) Hernia.....	63	70	57	55	69	57	59
(b) Obstruction of intestines.....	24	25	51	26	34	34	24
Other diseases of intestines.....	13	18	25	23	27	16	27
Acute yellow atrophy of liver.....	4	4	2	2	3	2	4
Hydatid tumors of liver.....	1	2	.....	1	1	.....	.....
Cirrhosis of liver.....	161	133	142	142	143	142	126
Biliary calculi.....	24	19	22	23	19	31	19
Other diseases of liver.....	28	19	38	28	42	34	30
Diseases of spleen.....	1	.....	.....	.....	5	1	.....
Peritonitis (nonpuerperal).....	46	37	53	33	46	40	38
Appendicitis.....	63	74	76	73	80	70	150
Other diseases of digestive system.....	22	29	7	6	18	24	24

	Aug.	Sept.	Oct.	Nov.	Dec.	Total
II. NERVOUS SYSTEM—(Continued)						
Softening of brain.....	14	13	19	10	25	222
Paralysis.....	62	87	111	94	101	1,117
General paralysis of insane.....	37	31	31	49	41	465
Other forms of mental disease.....	7	3	14	13	11	142
Other diseases of brain.....				2		11
Epilepsy.....	25	28	23	25	34	365
Convulsions (nonpuerperal).....			1	1	2	9
Convulsions of children.....	55	52	63	58	88	816
Tetanus.....	11	12	9	4	7	109
Chorea.....		1	2		3	21
Other diseases of nervous system.....	47	45	72	52	56	614
Diseases of the eye and its adnexa.....	1					8
Diseases of the ear.....	9	10	10	8	14	194
III. CIRCULATORY SYSTEM						
Pericarditis.....	17	6	9	13	12	153
Endocarditis.....	158	198	255	195	260	2,350
Heart disease.....	831	776	1,002	969	1,175	11,679
Angina pectoris.....	33	49	36	48	54	563
Diseases of arteries.....	209	190	242	269	283	3,134
Embolism and thrombosis.....	37	34	38	38	44	466
Diseases of veins.....	4	5	2	2	2	66
Diseases of lymphatics.....	2	3	1	4	2	30
Hemorrhages (except of lungs).....	7	8	14	8	13	132
Other diseases of circulatory system.....	34	10	27	10	17	211
IV. RESPIRATORY SYSTEM						
Diseases of nasal fossae.....	1	1			2	12
(a) Laryngitis.....		2	5	6	10	64
(b) Other diseases of larynx.....	1	4	5	7	7	57
Diseases of the thyroid body.....	4				1	20
Acute bronchitis.....	62	83	109	127	203	1,597
Chronic bronchitis.....	42	39	81	80	88	878
Bronchopneumonia.....	314	338	469	528	798	7,174
Pneumonia.....	262	374	539	773	1,130	9,423
Pleurisy.....	24	26	30	28	41	500
Congestion of lungs.....	22	15	20	23	32	330
Gangrene of lungs.....	2		1		7	39
Asthma.....	16	10	15	27	33	265
Emphysema.....	7	4	9	6	11	90
(a) Hemorrhage of lungs.....	8	2	4	3	5	48
(b) Other diseases of respiratory system.....	25	28	31	21	29	332
V. DIGESTIVE SYSTEM						
Diseases of mouth.....	4	1	7	8	2	41
(a) Tonsillitis.....	4	3	4	6	4	45
(b) Diseases of pharynx.....	7	10	9	11	9	113
Diseases of esophagus.....	5	1	3	3		24
Ulcer of stomach.....	31	25	32	36	32	353
Gastritis.....	38	37	35	36	33	417
(b) Other diseases of stomach.....	73	93	100	65	67	861
Dentition.....	4	2		2	1	24
Diarrhea and enteritis (under 2 years).....	1,691	1,161	679	283	199	6,801
Diarrhea and enteritis (2 years and over).....	228	249	176	87	78	1,384
Intestinal parasites.....	1	1	1			8
(a) Hernia.....	68	30	78	64	60	730
(b) Obstruction of intestines.....	27	54	35	28	31	393
Other diseases of intestines.....	29	26	31	16	23	274
Acute yellow atrophy of liver.....	4	1	4	6	5	41
Hydatid tumors of liver.....	1			1	1	8
Cirrhosis of liver.....	128	151	154	134	152	1,708
Biliary calculi.....	12	20	18	16	28	251
Other diseases of liver.....	25	38	28	23	30	363
Diseases of spleen.....	4					16
Peritonitis (nonpuerperal).....	38	44	38	30	32	475
Appendicitis.....	105	100	82	71	80	984
Other diseases of digestive system.....	26	27	31	29	15	258

	Jan.	Feb.	Mar.	April	May	June	July
VI. GENITO-URINARY SYSTEM							
Acute nephritis	132	108	130	126	110	97	107
Bright's disease	724	754	920	851	818	807	682
Other diseases of kidneys	20	12	16	19	20	20	13
Calculi of urinary tract	2	3	3	2	6	2	4
Diseases of bladder	33	37	32	41	32	41	30
Diseases of urethra, urinary abscess, etc.	2	2	6	4	2	3	2
Diseases of prostate	19	18	19	19	24	20	9
Nonvenereal diseases of (male) genital organs	1	1			2	3	2
Metritis	2	3	2	1			2
Uterine hemorrhage (nonpuerperal)			2		1	1	
Uterine tumor (noncancerous)	22	11	20	17	12	20	15
Other diseases of uterus	6	4	7	6	4	6	5
Ovarian tumors	4	5	6	9	9	9	8
Diseases of tubes	4	5	4	5	7	1	2
Other diseases of female genital organs	7	14	18	11	21	11	15
Nonpuerperal diseases of the breast (cancer excepted)	1	1	1			4	1
VII. CHILD BIRTH							
Accidents of pregnancy	22	8	14	22	19	10	27
Puerperal hemorrhage	8	8	12	9	9	9	9
Other accidents of labor	9	5	5	4	6	14	15
Puerperal septicemia	50	45	56	41	36	28	37
Puerperal convulsions	26	24	36	22	33	27	26
Puerperal phlegmasia alba dolens	1	11	1		8		
Other puerperal accidents	3	11	11	34	10	9	8
Puerperal diseases of the breast			1				
VIII. DISEASES OF THE SKIN							
Gangrene	27	29	25	29	33	31	29
Carbuncle	9	7	3		5	3	6
Abscess	9	16	16	20	12	19	16
Other diseases of the skin	8	6	8	6	5	11	6
IX. LOCOMOTOR SYSTEM							
Diseases of bones	13	20	19	22	33	36	26
Diseases of joints	2					1	1
Amputation	1						1
Other diseases of organs of locomotion	3	3	2		3	1	3
X. MALFORMATIONS							
Hydrocephalus	68	46	71	57	66	44	5
Congenital malformation of heart, cyanosis	29	17	25	26	39	28	64
Other congenital malformations	7	13	15	12	8	11	7
XI. EARLY INFANCY							
Premature birth	411	377	108	140	429	381	142
Congenital debility	116	102	406	372	99	106	359
Other diseases of early infancy	21	39	35	23	25	58	12
Lack of care	1	3	5	16	21	2	41
XII. OLD AGE							
Old age	185	186	220	214	211	152	159
XIII. VIOLENCE							
Suicide by poison	25	26	25	29	32	25	34
Suicide by asphyxia	27	17	41	35	23	27	25
Suicide by hanging or strangulation	14	12	17	20	19	20	22
Suicide by drowning		3	3	8	9	8	8
Suicide by firearms	34	31	38	36	34	25	43
Suicide by cutting instruments	4	7	11	8	6	13	8
Suicide by jumping from high places	4	2	1	7	5	15	5
Suicide by crushing			1				
Other suicides	1	2	1		1		
Fractures	49	36	48	61	42	59	59
Dislocations	2			2	3	4	3
Burns and scalds	72	59	61	49	45	45	51

	Aug.	Sept.	Oct.	Nov.	Dec.	Total
VI. GENITO-URINARY SYSTEM						
Acute nephritis.....	92	87	112	105	121	1,327
Bright's disease.....	675	665	774	783	940	9,393
Other diseases of kidneys.....	13	8	23	18	24	206
Calculi of urinary tract.....	3	1	2	2	4	35
Diseases of bladder.....	33	30	30	29	33	401
Diseases of urethra, urinary abscess, etc.	3	2	2	3	1	32
Diseases of prostate.....	16	17	35	16	20	232
Nonvenereal diseases of (male) genital organs.....			1	1	2	13
Metritis.....	1	1	2	3	2	19
Uterine hemorrhage (nonpuerperal).....	1	1	3	9	2	20
Uterine tumor (noncancerous).....	13	10	12	8	6	166
Other diseases of uterus.....	6	4	3	5	4	60
Ovarian tumors.....	10	6	3	4	8	81
Diseases of tubes.....	3	6	3	3	1	44
Other diseases of female genital organs.	9	12	14	17	9	158
Nonpuerperal diseases of the breast (cancer excepted).....	1					9
VII. CHILDBIRTH						
Accidents of pregnancy.....	22	20	16	16	13	209
Puerperal hemorrhage.....	6	9	7	9	16	111
Other accidents of labor.....	13	11	10	6	8	106
Puerperal septicemia.....	31	21	33	27	50	455
Puerperal convulsions.....	18	26	22	24	17	301
Puerperal phlegmasia alba dolens.....		4		3	1	24
Other puerperal accidents.....	7	11	8	7	7	126
Puerperal diseases of the breast.....						1
VIII. DISEASES OF THE SKIN						
Gangrene.....	24	39	41	21	25	353
Carbuncle.....	6	3	4	1	5	52
Abscess.....	11	7	14	9	19	168
Other diseases of the skin.....	5	8	6	3	4	76
IX. LOCOMOTOR SYSTEM						
Diseases of bones.....	14	20	17	18	21	259
Diseases of joints.....	3	1	1	3		12
Amputation.....						2
Other diseases of organs of locomotion.....		1			1	17
X. MALFORMATIONS						
Hydrocephalus.....	43	8	9	36	12	465
Congenital malformation of heart, cyanosis.....	67	77	90	55	67	584
Other congenital malformations.....	11	10	7	10	40	151
XI. EARLY INFANCY						
Premature birth.....	151	119	118	141	143	2,660
Congenital debility.....	460	416	384	355	364	3,539
Other diseases of early infancy.....	12	12	23	37	27	324
Lack of care.....	15	37	30	19		190
XII. OLD AGE						
Old age.....	154	173	162	188	185	2,189
XIII. VIOLENCE						
Suicide by poison.....	25	29	31	26	34	341
Suicide by asphyxia.....	22	22	21	29	19	308
Suicide by hanging or strangulation.....	16	12	16	16	17	201
Suicide by drowning.....	8	5	5	3	2	62
Suicide by firearms.....	28	28	42	34	39	412
Suicide by cutting instruments.....	7	4	15	8	5	96
Suicide by jumping from high places.....	2	6	4	3	6	60
Suicide by crushing.....		1	1			8
Other suicides.....	1	1				8
Fractures.....	61	66	63	59	61	664
Dislocations.....	2	4	6	3	4	33
Burns and scalds.....	44	67	65	100	78	736

	Jan.	Feb.	Mar.	April	May	June	July
XIII. VIOLENCE—(Continued)							
Burning by corrosive substances.....						1	
Heat and sunstroke.....						92	43
Cold and freezing.....	7	2	4	4	2		
Electric shock.....	1	4	5	6	5	8	8
Drowning.....	12	21	29	63	110	159	193
Starvation, privation, etc.....	1			1	1		2
Inhalation of poisonous gases.....	48	25	51	38	24	18	7
Other accidental poisonings.....	20	24	20	21	27	21	24
Accidental gunshot wounds.....	9	6	5	6	7	7	10
Injuries by machinery.....	6	8	4	10	6	7	8
Injuries in mines and quarries.....				1	17	2	
Railroad accidents and injuries.....	57	60	67	77	91	93	110
Injuries by horses and vehicles.....	24	13	33	47	32	43	35
Other accidental traumatisms.....	82	105	118	123	130	125	133
Suffocation.....	14	14	8	9	14	9	4
Injuries at birth.....	37	47	51	42	27	50	45
Homicide.....	20	18	23	31	24	24	22
Other external violence.....	13	12	16	24	12	16	12
Opium habit.....					3		
XIV. ILL-DEFINED DISEASES							
Dropey.....	3	3	5	3	3	3	4
Sudden death.....	1						
Heart failure.....	4	4	11	7	12	5	5
Insanition.....	1		10	3		1	2
Debility (over 3 months).....	1				2		
Marasmus.....	7	40	55	55	8	17	17
Fever.....	1	1		1	3	1	
Other ill-defined diseases.....	31	3	5	3	40	43	69
Unknown.....		3	3		2		5
Total.....	11,486	11,011	13,114	12,828	12,147	10,712	1,210

	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
XIII. VIOLENCE—(Continued)						
Burning by corrosive substances					1	2
Heat and sunstroke	20		2			155
Cold and freezing				3	7	31
Electric shock	5	3	6	2	4	57
Drowning	172	99	66	49	33	1,006
Starvation, privation, etc.	5	4		2	2	18
Inhalation of poisonous gases	17	28	43	44	64	408
Other accidental poisonings	24	21	13	16	20	251
Accidental gunshot wounds	4	8	6	7	11	86
Injuries by machinery	11	5	12	13	15	105
Injuries in mines and quarries	2		5	1	1	29
Railroad accidents and injuries	98	108	105	104	101	1,071
Injuries by horses and vehicles	38	47	64	29	38	443
Other accidental traumatism	176	140	129	121	120	1,502
Suffocation	4	6	7	16	24	129
Injuries at birth	46	49	33	33	38	498
Homicide	36	28	19	18	23	286
Other external violence	10	21	27	18	41	222
Opium habit			3			6
XIV. ILL-DEFINED DISEASES						
Dropsy	1	5	4	6	3	43
Sudden death						1
Heart failure	9	8	6	10	16	97
Inanition	5	9	4	6	3	45
Debility (over 3 months)						3
Marasmus	119	58	26	57	24	483
Fever	1		1			9
Other ill-defined diseases	6	116	82	6	26	430
Unknown		8		11	4	36
Total	11,617	11,067	11,459	10,884	12,726	140,261

Total Mortality for the Year 1909 in the Sanitary Districts

SANITARY DISTRICTS	Population, U. S. census estimate 1909	Total deaths	Ages									
			Deaths under 1 year	Deaths 1 to 4 years	Deaths 5 to 10 years	Deaths 20 to 39 years	Deaths 40 to 59 years	Deaths at 60 years and over				
MARITIME DISTRICT:												
City of New York:												
BOROUGH OF MANHATTAN.....			2,305,196	37,961	8,893	4,490	1,986	6,802	8,403	7,387		
BOROUGH OF THE BRONX.....			328,460	6,426	967	561	444	1,604	1,494	1,336		
BOROUGH OF BROOKLYN.....			1,505,925	24,365	4,925	2,957	1,471	4,218	5,045	5,749		
BOROUGH OF QUEENS.....			233,709	3,838	843	405	276	605	791	918		
BOROUGH OF RICHMOND.....			77,673	1,515	296	139	73	245	300	462		
Totals.....			4,450,963	74,105	15,944	8,552	4,250	13,474	16,033	15,852		
Freeport, village (Nassau Co.).....			5,155	76	15	7	8	9	10	27		
Hempstead, town (Nassau Co.).....			32,591	411	52	38	34	57	62	166		
North Hempstead, town (Nassau Co.).....			15,890	294	54	30	19	57	58	75		
Oyster Bay, town (Nassau Co.).....			23,984	284	58	20	12	37	43	114		
Rockville Center, village (Nassau Co.).....			3,272	49	8	2	1	7	11	20		
Amityville, village (Suffolk Co.).....			2,748	62	3	1	5	6	10	36		
Babylon, village (Suffolk Co.).....			2,520	29	3	1	2	7	2	14		
Brookhaven, town (Suffolk Co.).....			13,370	199	20	7	7	19	36	109		
Greenport, village (Suffolk Co.).....			2,913	33	3	1	1	5	7	15		
Huntington, town (Suffolk Co.).....			10,851	161	29	10	11	19	26	66		
Patchogue, village (Suffolk Co.).....			3,671	47	6	5	6	2	8	20		
Sag Harbor, village (Suffolk Co.).....			3,229	34	4	1	2	2	7	18		
Southold, town (Suffolk Co.).....			6,638	63	8	1	1	13	8	31		
Rest of county.....			38,799	1,077	73	25	36	219	336	387		
Dobbs Ferry, village (Westchester Co.).....			4,027	76	19	4	7	15	14	17		
Greenburgh, town (Westchester Co.).....			4,648	61	20	3	7	4	7	20		
Hastings-on-Hudson, village (Westchester Co.).....			3,923	45	10	4	2	8	9	12		
Irvington, village (Westchester Co.).....			2,684	22	5	3	0	3	3	8		
Mamaroneck, town (Westchester Co.).....			6,103	93	13	8	8	8	26	29		
Mount Vernon (Westchester Co.).....			27,891	392	80	38	20	49	81	124		
New Rochelle (Westchester Co.).....			24,920	323	74	35	18	44	59	93		
No. Tarrytown, village (Westchester Co.).....			5,166	90	26	13	5	10	7	19		
Ossining, village (Westchester Co.).....			6,478	182	29	15	6	20	40	72		
Pekskill, village (Westchester Co.).....			15,523	247	58	22	9	38	42	77		
Port Chester, village (Westchester Co.).....			14,267	204	50	31	5	26	37	55		
Rye, town (Westchester Co.).....			8,070	66	6	7	5	10	19	19		
Tarrytown, village (Westchester Co.).....			5,880	84	11	10	6	16	19	22		
White Plains, village (Westchester Co.).....			14,584	238	53	29	20	30	41	65		
Yonkers (Westchester Co.).....			72,200	1,125	301	148	70	198	189	218		
Rest of county.....			48,358	819	115	41	40	117	189	308		
Totals for the District.....			4,881,466	80,981	17,150	9,112	4,623	14,529	17,439	18,108		
HUDSON VALLEY DISTRICT:												
Albany (Albany Co.).....			100,730	1,759	227	87	82	284	465	613		
Cohoes (Albany Co.).....			24,185	488	123	64	27	74	88	111		
Green Island, village (Albany Co.).....			4,967	66	19	1	1	6	11	28		
Watervliet (Albany Co.).....			14,009	230	43	18	10	40	48	70		
Rest of county.....			31,746	419	60	17	14	49	60	208		
Hudson (Columbia Co.).....			11,032	172	34	8	8	23	38	61		
Rest of county.....			31,836	476	50	9	21	58	68	270		
Fishkill, town (Dutchess Co.).....			3,761	51	17	5	5	6	6	12		
Fishkill Landing, village (Dutchess Co.).....			4,156	60	12	7	0	6	13	21		
Matteawan, village (Dutchess Co.).....			5,402	98	16	8	2	10	25	37		
Poughkeepsie (Dutchess Co.).....			26,039	501	78	30	18	64	106	205		
Wappingers Falls, village (Dutchess Co.).....			3,657	70	16	2	3	10	9	29		
Rest of county.....			38,618	836	70	24	20	115	195	408		
Catskill, village (Greene Co.).....			5,139	73	11	5	8	9	11	29		
Coxsackie, town (Greene Co.).....			4,493	62	7	4	3	4	11	33		
Rest of county.....			21,498	383	34	11	12	40	58	226		
Goshen, town (Orange Co.).....			5,398	108	12	4	4	16	21	51		
Middletown (Orange Co.).....			16,610	256	32	13	11	48	46	104		
Montgomery, town (Orange Co.).....			3,016	57	8	3	2	7	10	26		
Newburgh (Orange Co.).....			27,418	482	68	29	27	78	102	178		
Port Jervis (Orange Co.).....			9,943	183	18	8	11	36	28	82		
Walden, village (Orange Co.).....			4,219	58	10	3	5	9	10	21		

Total Mortality for the Year 1909 in the Sanitary Districts
— (Continued)

SANITARY DISTRICTS	EPIDEMIC DISEASES									
	Typoid fever	Malarial diseases	Smallpox	Measles	Scarlatina	Whooping cough	Diphtheria and group	Influenza	Erysipelas	Cerebro-spinal meningitis
MARITIME DISTRICT:										
City of New York:										
BOROUGH OF MANHATTAN	262	7	2	388	359	220	962	166	224	182
BOROUGH OF THE BRONX	63	3		58	49	34	103	16	18	32
BOROUGH OF BROOKLYN.....	191	24		508	327	118	557	138	64	96
BOROUGH OF QUEENS.....	37	4		30	42	23	73	10	3	8
BOROUGH OF RICHMOND.....	11	1		12	10	6	20	4	2	5
Totals.....	564	39	2	996	787	401	1,715	334	311	323
Freeport, village (Nassau Co.)					1	1	2			3
Hempstead, town (Nassau Co.)	4	1		2	1	4	10	3	1	
North Hempstead, town (Nassau Co.)	6	1		2	1	1	5	1	1	4
Oyster Bay, town (Nassau Co.)	1				1	3	6	2		1
Rockville Center, village (Nassau Co.)					1		2			1
Amityville, village (S. folk Co.)	1									
Babylon, village (S. folk Co.)										
Brookhaven, town (S. folk Co.)	2						1	4		
Greenport, village (S. folk Co.)	1									
Huntington, town (S. folk Co.)					3	3	1	4		1
Patchogue, village (Suffolk Co.)							4			
Sag Harbor, village (S. folk Co.)								2		
Southold, town (Suffolk Co.)	1							1		
Rest of county	5			1	2	2	9	10		2
Dobbs Ferry, village (Westchester Co.)	1				1					
Greenburgh, town (Westchester Co.)										1
Hastings-on-Hudson, village (Westchester Co.)										
Irvington, village (Westchester Co.)						2				
Mamaroneck, town (Westchester Co.)				2				1		1
Mount Vernon (Westchester Co.)	2	1		3		5	5		1	1
New Rochelle (Westchester Co.)	6			1	1	2	7	1	3	2
North Tarrytown, village (Westchester Co.)				4		3	1	1		
Ossining, village (Westchester Co.)	4					1	3	3		1
Peekskill, village (Westchester Co.)	2					1		1		
Port Chester, village (Westchester Co.)	1			5	1	1	3	3	1	2
Rye, town (Westchester Co.)					1					
Tarrytown, village (Westchester Co.)	2					2	1			
White Plains, village (Westchester Co.)	2		1	15		1	3	1	1	
Yonkers (Westchester Co.)	5	3		1	18	6	18	1	6	3
Rest of county	3	1		1	6	6	11	8	5	1
Totals for the District	613	46	3	1,033	825	439	1,807	383	330	347
HUDSON VALLEY DISTRICT:										
Albany (Albany Co.)	19			7	4	9	19	9	3	
Cohoes (Albany Co.)	20		1	11		6	5	1		4
Green Island, village (Albany Co.)						2				
Watervliet (Albany Co.)	1	1		1		5		6		
Rest of county	2						7	6	1	3
Hudson (Columbia Co.)	1					3				1
Rest of county	6				6	3	1	4	3	1
Fishkill, town (Dutchess Co.)				3		1				
Fishkill Landing, village (Dutchess Co.)				1					1	
Mattawan, village (Dutchess Co.)	2					3	1			
Poughkeepsie (Dutchess Co.)	6			2	2	7	5	2		1
Wappingers Falls, village (Dutchess Co.)							2			
Rest of county	3			4	1	2	8	6		1
Catskill, village (Greene Co.)	1	1			1		1			1
Coxsackie, town (Greene Co.)	1					1		1		1
Rest of county	6	1			1	1	3	3		1
Goshen, town (Orange Co.)	1				1		1	2		
Middletown (Orange Co.)	3	1			2	1	3	4		2
Montgomery, town (Orange Co.)	4					1	1			
Newburgh (Orange Co.)	13				2	2	2	3		1
Port Jervis (Orange Co.)	2							5		
Walden, village (Orange Co.)	3				1					

Total Mortality for the Year 1909 in the Sanitary Districts
— (Continued)

SANITARY DISTRICTS	Pulmonary tuberculosis	Cancer	Other general diseases	Diseases of the nervous system	Diseases of the circulatory system	Pneumonia	Other diseases of the respiratory system	Diarthra and enteritis (under 2 years)	Other diseases of the digestive system	Bright's disease
MARITIME DISTRICT:										
City of New York:										
BOROUGH OF MANHATTAN	4,206	1,827	3,209	1,511	4,830	2,566	4,204	2,547	1,970	2,342
BOROUGH OF THE BRONX	1,623	205	386	281	858	382	407	304	289	346
BOROUGH OF BROOKLYN	2,348	1,110	1,500	962	3,657	1,921	2,429	1,825	1,324	1,759
BOROUGH OF QUEENS	309	170	280	135	597	279	363	351	213	258
BOROUGH OF RICHMOND	159	85	128	67	195	101	99	111	81	148
Totals	8,645	3,487	5,503	2,956	10,137	5,249	7,502	5,138	3,877	4,853
Freeport, village (Nassau Co.)	4	5	6	6	5	8	1	7	10	8
Hempstead, town (Nassau Co.)	28	16	45	41	51	20	25	12	30	43
North Hempstead, town (Nassau Co.)	21	14	19	29	22	11	18	21	27	17
Oyster Bay, town (Nassau Co.)	23	11	18	27	38	20	17	19	19	20
Rockville Center, village (Nassau Co.)	8	5	3	8	6	3	.....	1	5	2
Amityville, village (Suffolk Co.)	5	1	1	19	8	2	2	.....	5	10
Babylon, village (Suffolk Co.)	4	.....	2	2	2	2	2	2	4	7
Brookhaven, town (Suffolk Co.)	16	9	9	37	22	10	7	8	17	19
Greenport, village (Suffolk Co.)	4	1	4	2	5	.....	2	.....	6	2
Huntington, town (Suffolk Co.)	14	9	15	16	21	3	10	8	9	22
Patchogue, village (Suffolk Co.)	3	6	4	7	1	3	3	1	2	2
Sag Harbor, village (Suffolk Co.)	1	4	3	5	5	2	2	.....	2	3
Southold, town (Suffolk Co.)	4	4	6	12	7	3	3	2	4	5
Rest of county	113	46	48	240	162	47	130	25	70	85
Dobbs Ferry, village (Westchester Co.)	6	1	10	4	7	6	2	7	8	9
Greenburgh, town (Westchester Co.)	4	4	4	6	10	2	4	5	2	6
Hastings-on-Hudson, vil. (West'r Co.)	6	.....	6	5	5	4	1	5	3	3
Irvington, village (Westchester Co.)	.....	.....	4	2	2	3	1	.....	1	.....
Mamaroneck, town (Westchester Co.)	6	4	5	9	9	1	5	6	8	14
Mount Vernon (Westchester Co.)	29	21	33	36	32	22	29	35	33	40
New Rochelle, (Westchester Co.)	23	13	25	24	23	23	33	24	27	31
No. Tarrytown, village (West. Co.)	10	1	4	6	5	4	8	12	5	5
Ossining, village (Westchester Co.)	14	7	22	20	17	14	6	10	11	24
Peekskill, village (Westchester Co.)	17	12	32	35	13	20	14	23	15	29
Port Chester, village (Westchester Co.)	8	8	13	16	16	12	24	26	15	16
Rye, town (Westchester Co.)	7	5	7	7	7	1	4	4	4	6
Tarrytown, village (Westchester Co.)	7	2	5	7	10	6	3	2	8	8
White Plains, village (West. Co.)	16	9	29	24	19	18	12	19	14	11
Yonkers (Westchester Co.)	107	43	101	76	125	98	109	141	80	45
Rest of county	99	93	58	87	79	50	41	35	48	65
Totals for the District	9,252	3,841	6,044	3,771	10,871	5,667	8,020	5,598	4,369	5,410
HUDSON VALLEY DISTRICT:										
Albany (Albany Co.)	170	118	107	180	287	80	79	54	140	145
Cohoes (Albany Co.)	59	18	42	47	33	26	43	47	34	25
Green Island, village (Albany Co.)	4	4	7	5	8	4	5	1	4	6
Watervliet (Albany Co.)	29	7	17	29	25	23	21	14	15	8
Rest of county	21	24	32	48	57	31	21	12	26	40
Hudson (Columbia Co.)	14	10	18	18	19	11	5	15	14	18
Rest of county	41	25	33	56	64	18	20	12	36	60
Fishkill, town (Dutchess Co.)	2	1	4	8	1	7	4	6	1	1
Fishkill Landing, vil. (Dutchess Co.)	3	2	3	9	5	12	3	4	4	7
Matteawan, village (Dutchess Co.)	6	5	5	12	7	14	2	4	9	10
Poughkeepsie (Dutchess Co.)	34	38	39	61	72	36	23	20	41	34
Wappinger Falls, vil. (Dutchess Co.)	9	3	4	5	9	7	5	2	3	10
Rest of county	106	37	45	141	133	58	40	20	53	47
Catskill, village (Greene Co.)	9	4	7	9	6	4	4	2	4	7
Coxsackie, town (Greene Co.)	3	2	5	9	7	.....	6	1	7	7
Rest of county	43	23	35	51	52	14	14	5	37	44
Goshen, town (Orange Co.)	16	2	8	22	15	2	5	1	4	1
Middletown (Orange Co.)	20	12	20	32	29	13	7	6	25	27
Montgomery, town (Orange Co.)	6	2	3	8	6	2	1	1	6	6
Montgomery, town (Orange Co.)	45	17	37	63	52	41	25	13	39	46
Port Jervis (Orange Co.)	8	8	14	15	24	25	9	3	21	15
Walden, village (Orange Co.)	9	2	9	5	2	3	2	1	5	6

Total Mortality for the Year 1909 in the Sanitary Districts
— (Continued)

SANITARY DISTRICTS	Other diseases of the genito-urinary system	The puerperal state	Diseases of the skin	Diseases of the organs of locomotion	Malformations	Early infancy (under three months)	External causes	Ill-defined diseases	BIRTHS		
									Total births	Still births	
MARITIME DISTRICT:											
City of New York:											
BOROUGH OF MANHATTAN	581	363	146	129	269	1,322	2,555	612	62,990	3,742	
BOROUGH OF THE BRONX	93	64	13	14	37	199	373	86	9,574	455	
BOROUGH OF BROOKLYN	486	230	62	57	317	593	1,400	302	41,494	2,202	
BOROUGH OF QUEENS	61	43	8	1	22	102	304	112	6,317	358	
BOROUGH OF RICHMOND	31	15	8	2	3	36	107	68	1,992	81	
Totals	1,252	715	237	203	648	2,252	4,799	1,180	122,367	6,808	
Freeport, village (Nassau Co.)		1	3				3		64	0	
Hempstead, town (Nassau Co.)	10	3	1	2	6	5	34	13	672	27	
North Hempstead, town (Nassau Co.)	5	7	2			8	45	6	419	7	
Oyster Bay, town (Nassau Co.)	9	2	2		3	10	22	10	519	16	
Rockville Center, village (Nassau Co.)	1	1			1	1			50	1	
Amityville, village (Suffolk Co.)	2					1	3	2	7	1	
Babylon, village (Suffolk Co.)	1						1		53	1	
Brookhaven, town (Suffolk Co.)	2	1	3		2	4	12	14	232	11	
Greenport, village (Suffolk Co.)	2						3	1	112	2	
Huntington, town (Suffolk Co.)	3		1		3		13	2	208	5	
Patchogue, village (Suffolk Co.)	2				1		6	2	115	0	
Sag Harbor, village (Suffolk Co.)							2	3	68	1	
Southold, town (Suffolk Co.)	1	1			1		7	1	120	1	
Rest of county	16	4	7		1	9	35	8			
Dobbs Ferry, village (Westchester Co.)		1			1		11	1	83	3	
Greenburgh, town (Westchester Co.)				1	1	3	6	2	86	0	
Hastings-on-Hudson, vil. (West. Co.)							6	1	99	6	
Irvington, village (Westchester Co.)					2		4	1	53	0	
Mamaroneck, town (Westchester Co.)	5		1		1	1	12	2	131	8	
Mount Vernon (Westchester Co.)	8	3	1	1	4	8	26	13	789	29	
New Rochelle (Westchester Co.)	10	2	1		3	10	23	5	721	31	
North Tarrytown, vil. (Westch. Co.)	1	1				3	5	1	212	3	
Ossining, village (Westchester Co.)	7	1			2	2	10	3	185	5	
Pekskill, village (Westchester Co.)	1	5	1		4	6	13	3	310	13	
Port Chester, vil. (Westchester Co.)	7	2	1	1	2	2	13	5	401	29	
Rye, town (Westchester Co.)	1					1	9	2	7	0	
Tarrytown, village (Westchester Co.)		2				4	12	4	87	8	
White Plains, village (West. Co.)	2				1	6	29	4	420	8	
Yonkers (Westchester Co.)	29	12	1	2	5	1	77	18	1,961	89	
Rest of county	15	6	9	1	10	18	54	9			
Totals for the District	1,392	770	271	211	702	2,355	5,295	1,316			
HUDSON VALLEY DISTRICT:											
Albany (Albany Co.)	75	6	10	4		9	71	104	50	1,238	92
Cohoes (Albany Co.)	9	2	4	2	5	14	27	3	511	25	
Green Island, village (Albany Co.)		1			1	3	6	5	68	1	
Watervliet (Albany Co.)	10		2			5	9	2	196	9	
Rest of county	9	4	2		3	7	49	14			
Hudson (Columbia Co.)	4	2			3		11	5	197	16	
Rest of county	11	3	3		4	6	40	21			
Fishkill, town (Dutchess Co.)					1	1	9	1	57	3	
Fishkill Landing, village (Dutchess Co.)	2						4		93	2	
Matteawan, village (Dutchess Co.)	3	2	1		2	1	6	3	115	5	
Poughkeepsie (Dutchess Co.)	8	1	3	2	3	16	34	11	542	14	
Wappingers Falls, village (Dutch. Co.)	1					8	1	1	92	0	
Rest of county	24	6	10		3	16	54	18			
Catskill, village (Greene Co.)	1		1		4	1	4	1	85	9	
Coxsackie, town (Greene Co.)	2				2	1	4	2	90	5	
Rest of county	8	1	3			5	23	9			
Goshen, town (Orange Co.)		1			3	1	10	12	80	3	
Middletown (Orange Co.)	7	3	1		2	8	24	4	281	24	
Montgomery, town (Orange Co.)	1					2	5	2	61	6	
Newburgh (Orange Co.)	17	7	3		5	11	29	9	473	20	
Port Jervis (Orange Co.)	2	1	4		2	4	16	5	174	8	
Walden, village (Orange Co.)	1					3	2	3	81	1	

Total Mortality for the Year 1909 in the Sanitary Districts
— (Continued)

SANITARY DISTRICTS	Population, U. S. census estimate 1909	Total deaths	AGES					
			Deaths under 1 year	Deaths 1 to 4 years	Deaths 5 to 19 years	Deaths 20 to 39 years	Deaths 40 to 59 years	Deaths at 60 years and over
HUDSON VALLEY DISTRICT — (Cont'd.)								
Warwick, town (Orange Co.)	6,925	93	17	6	8	9	21	32
Rest of county	38,262	672	110	32	36	110	133	248
Cold Spring, village (Putnam Co.)	2,561	51	11	9	2	5	6	18
Rest of county	11,912	218	22	5	5	32	38	116
Hoosick Falls, village (Rensselaer Co.)	4,908	83	12	5	3	14	21	28
Rensselaer (Rensselaer Co.)	13,368	174	28	8	13	20	39	75
Troy (Rensselaer Co.)	77,242	1,487	212	81	67	248	357	522
Rest of county	39,019	464	52	10	30	36	82	254
Haverstraw, town (Rockland Co.)	10,978	154	34	14	6	24	27	49
Nyack, village (Rockland Co.)	4,576	74	9	4	6	10	11	34
Ramapo, town (Rockland Co.)	8,796	92	15	4	2	11	13	47
Spring Valley, village (Rockland Co.)	3,186	22	3	3	1	3	5	7
Suffern, village (Rockland Co.)	3,501	52	5	0	2	17	10	16
Rest of county	19,369	278	44	33	15	32	35	116
Ellenville, village (Ulster Co.)	2,867	54	3	0	0	5	10	36
Esopus, town (Ulster Co.)	4,687	58	10	6	9	5	9	19
Kingston (Ulster Co.)	26,110	519	70	24	40	84	116	185
Marl-town, town (Ulster Co.)	2,561	65	12	4	5	12	8	24
Rosendale, town (Ulster Co.)	3,356	65	11	2	7	9	10	26
Saugerties, village (Ulster Co.)	3,944	61	10	1	3	6	13	28
Rest of county	43,135	698	97	38	36	87	113	324
Totals for the District	729,735	12,322	1,752	649	590	1,772	2,506	5,019
ADIRONDACK AND NORTHERN DIST.:								
Plattsburg (Clinton Co.)	11,450	199	48	19	7	32	35	57
Rest of county	35,832	455	91	28	29	47	77	181
Malone, village (Franklin Co.)	6,022	101	12	7	6	16	14	46
Saranac Lake, village (Franklin Co.)	4,847	144	15	2	8	73	30	14
Turner Lake, village (Franklin Co.)	3,415	44	16	5	2	5	8	8
Rest of county	35,172	504	115	33	24	69	64	198
Essex county	33,848	519	89	32	27	71	81	218
Hamilton county	4,912	44	7	4	3	6	5	19
Carthage, village (Jefferson Co.)	3,820	42	4	4	0	4	13	17
Clayton, town (Jefferson Co.)	3,917	61	9	2	8	14	4	24
Ellisburg, town (Jefferson Co.)	3,620	73	8	1	2	9	12	41
Watertown (Jefferson Co.)	24,140	423	79	19	26	62	86	151
Rest of county	43,930	578	69	29	22	60	94	312
Lowville, town (Lewis Co.)	4,064	71	2	0	6	3	19	41
Rest of county	22,579	298	40	6	14	18	39	181
Canton, town (St. Lawrence Co.)	7,133	100	6	3	2	5	14	70
Gouverneur, town (St. Lawrence Co.)	7,126	96	17	5	5	12	12	45
Massena, village (St. Lawrence Co.)	2,968	56	13	7	3	4	7	22
Ogdensburg (St. Lawrence Co.)	14,921	245	55	13	17	36	39	85
Potsdam, village (St. Lawrence Co.)	4,423	61	12	2	0	5	11	31
Rest of county	54,242	897	116	45	39	108	167	421
Glens Falls (Warren Co.)	16,279	226	37	9	10	42	44	78
Rest of county	17,248	277	36	7	8	32	52	141
Fort Edward, town (Washington Co.)	5,369	70	17	3	2	14	8	26
Granville, town (Washington Co.)	7,524	84	15	5	3	9	13	39
Greenwich, town (Washington Co.)	4,473	75	10	4	4	5	14	38
Hudson Falls, village (Washington Co.)	6,014	72	17	5	2	9	9	30
Whitehall, village (Washington Co.)	3,901	162	16	13	8	10	16	29
Rest of county	21,435	339	35	6	12	30	61	193
Totals for the District	419,564	6,256	1,006	309	395	812	1,048	2,766
MOHAWK VALLEY DISTRICT:								
Johnstown (Fulton Co.)	9,473	155	15	6	9	15	33	77
Gloversville (Fulton Co.)	18,761	300	36	13	12	44	71	124
Rest of county	14,096	219	22	6	11	17	33	129
Frankfort, village (Herkimer Co.)	8,038	44	12	0	2	3	7	20
Herkimer, village (Herkimer Co.)	7,446	114	34	6	9	15	15	35

Total Mortality for the Year 1909 in the Sanitary Districts
— (Continued)

SANITARY DISTRICTS	EPIDEMIC DISEASES									
	Typhoid fever	Malarial diseases	Smallpox	Measles	Scarlatina	Whooping cough	Diphtheria and group	Influenza	Erysipelas	Cerebro-spinal meningitis
HUDSON VALLEY DIST. — (Cont'd)										
Warwick, town (Orange Co.)	1	1			1	1	5	3		
Rest of county	4	1		2	3	2	5	9		2
Cold Spring, village (Putnam Co.)										
Rest of county		1		2			1	3		
Hoosick Falls, village (Rensselaer Co.)						1		3		2
Rensselaer (Rensselaer Co.)	4							3		
Troy (Rensselaer Co.)	17				6	10	6	12	4	8
Rest of county	9				3	4	2	10		1
Haverstraw, town (Rockland Co.)	1	3				3	1		1	
Nyack, village (Rockland Co.)	1				1		1			
Ramapo, town (Rockland Co.)					1	1	1	1	2	
Spring Valley, village (Rockland Co.)										1
Suffern, village (Rockland Co.)	1									
Rest of county	1	2		8		7	8	4	1	
Ellenville, village (Ulster Co.)	1									
Esopus, town (Ulster Co.)				1			5	3		2
Kingston (Ulster Co.)	8			1			9	5	1	5
Marbletown, town (Ulster Co.)	2					1				
Rosendale, town (Ulster Co.)				1				5		
Saugerties, village (Ulster Co.)								1		
Rest of county	2	1		6		8	3	12		1
Totals for the District	146	13	1	50	36	85	105	126	17	39
ADIRONDACK AND NORTHERN DISTRICT:										
Plattsburg (Clinton Co.)	3					3	1	1		2
Rest of county	1			3	1	5	2	19	3	1
Malone, village (Franklin Co.)	4							1	1	
Saranac Lake, village (Franklin Co.)	1			1						
Tupper Lake, village (Franklin Co.)	1									1
Rest of county	6				1	6	2	11	2	1
Essex county	6			13		2	3	7	3	1
Hamilton county						1	1			
Carthage, village (Jefferson Co.)						2				
Clayton, town (Jefferson Co.)	2	2				1		1		
Ellisburg, town (Jefferson Co.)	1									
Watertown (Jefferson Co.)	11	1			1	5	2	5		
Rest of county	8				1	7		16		2
Lewville, town (Lewis Co.)	1									
Rest of county	5			2		3		10		
Canton, town (St. Lawrence Co.)	2							1		
Gouverneur, town (St. Lawrence Co.)	1					2	1			
Massena, village (St. Lawrence Co.)	1					2	3			
Ogdensburg (St. Lawrence Co.)	4			3		3	3	2	3	2
Potsdam, village (St. Lawrence Co.)										
Rest of county	7			2		11	4	9	3	2
Glens Falls (Warren Co.)	1						1	1		1
Rest of county	4							3	1	2
Fort Edward, town (Washington Co.)	2						2			
Granville, town (Washington Co.)	2				1		1	3		
Greenwich, town (Washington Co.)					2			4		
Sandy Hill, village (Washington Co.)				1			2			
Whitehall, village (Washington Co.)	2			3	1	1	2	2	1	
Rest of county	4			1			2	2	1	1
Totals for the District	80	3		29	8	54	32	100	18	15
MOHAWK VALLEY DISTRICT:										
Johnstown (Fulton Co.)							2	2		1
Gloversville (Fulton Co.)	2				1	1	10	1		2
Rest of county	1	1					1	5	1	
Frankfort, village (Herkimer Co.)						2				
Herkimer, village (Herkimer Co.)					1					

Total Mortality for the Year 1909 in the Sanitary Districts
— (Continued)

SANITARY DISTRICTS	Pulmonary tuberculosis	Cancer	Other general diseases	Diseases of the nervous system	Diseases of the circulatory system	Pneumonia	Other diseases of the respiratory system	Diarrhea and enteritis (under 2 years)	Other diseases of the digestive system	Bright's disease
HUDSON VALLEY DIST.—(Cont'd)										
Warwick, town (Orange Co.)	7	4	8	11	9	5	4	3	8	2
Rest of county	54	26	44	77	72	57	51	29	50	50
Cold Spring, village (Putnam Co.)	5	2	4	7	3	8	3	3	2	5
Rest of county	24	14	13	31	31	14	7	2	17	19
Hosnick Falls, village (Rensselaer Co.)	14	2	9	6	11	7	8	4	6	6
Rensselaer (Rensselaer Co.)	12	12	9	23	25	13	9	7	18	11
Troy (Rensselaer Co.)	185	94	113	179	202	98	63	48	115	101
Rest of county	41	23	28	71	83	32	25	6	22	37
Haverstraw, town (Rockland Co.)	14	8	10	17	17	19	8	16	8	11
Nyack, village (Rockland Co.)	4	7	5	11	6	4	4	4	12	5
Ramapo, town (Rockland Co.)	7	3	9	16	8	6	3	1	5	8
Spring Valley, village (Rockland Co.)	1	1	1	2	4	1	1	1	6	6
Suffern, village (Rockland Co.)	3	3	5	13	5	7	1	1	5	1
Rest of county	18	17	20	26	48	17	17	8	10	27
Ellenville, village (Ulster Co.)	4	2	5	5	7	4	3	1	5	8
Esopus, town (Ulster Co.)	3	1	1	6	6	6	2	3	3	4
Kingston (Ulster Co.)	62	22	39	76	69	42	20	12	36	26
Marbletown, town (Ulster Co.)	3	2	5	8	8	9	2	2	4	2
Rosendale, town (Ulster Co.)	7	2	3	10	8	8	2	1	3	8
Saugerties, village (Ulster Co.)	7	3	6	12	7	3	8	2	3	5
Rest of county	52	46	38	101	80	70	33	29	52	42
Totals for the District	1,181	657	869	1,541	1,622	860	617	427	906	954
ADIRONDACK AND NORTHERN DISTRICT:										
Plattsburg (Clinton Co.)	16	12	21	27	18	12	14	17	9	5
Rest of county	53	21	28	38	57	40	20	22	30	21
Malone, village (Franklin Co.)	9	5	8	10	11	10	8	5	6	7
Saranac Lake, village (Franklin Co.)	106	2	5	2	4	3	4	4	3	1
Tupper Lake, village (Franklin Co.)	8	1	5	4	4	2	1	8	2	1
Rest of county	42	27	39	58	43	40	32	26	31	29
Essex county	48	20	49	57	58	32	24	27	41	32
Hamilton county	1	5	6	2	6	2	4	6	3	3
Carthage, village (Jefferson Co.)	4	2	6	4	7	1	1	2	2	2
Clayton, town (Jefferson Co.)	5	3	10	2	2	2	3	7	1	1
Ellisburg, town (Jefferson Co.)	3	6	8	11	7	5	7	11	3	3
Watertown (Jefferson Co.)	30	21	46	53	58	21	24	13	49	12
Rest of county	31	30	61	78	81	33	33	10	58	36
Lowville, town (Lewis Co.)	4	1	9	23	9	6	3	4	4	5
Rest of county	6	12	22	54	32	30	18	4	21	21
Canton, town (St. Lawrence Co.)	2	5	6	22	16	3	9	2	9	8
Gouverneur, town (St. Lawrence Co.)	1	11	6	20	17	4	3	4	5	3
Massena, village (St. Lawrence Co.)	3	4	4	7	6	7	1	1	8	1
Ogdensburg (St. Lawrence Co.)	17	18	17	26	34	18	18	9	15	10
Potodan, village (St. Lawrence Co.)	5	9	6	6	7	5	5	4	3	3
Rest of county	80	41	68	115	152	79	55	30	68	58
Glens Falls (Warren Co.)	24	17	22	29	24	11	9	6	22	12
Rest of county	19	19	14	38	32	24	8	5	18	32
Ft. Edward, town (Washington Co.)	1	3	11	7	12	5	4	5	2	1
Granville, town (Washington Co.)	3	7	6	13	6	6	4	6	4	13
Greenwich, town (Washington Co.)	7	2	2	13	111	1	4	4	8	6
Sandy Hill, village (Washington Co.)	3	3	10	7	14	2	5	4	5	4
Whitehall, village (Washington Co.)	2	9	3	12	10	13	10	10	5	8
Rest of county	23	21	20	53	63	23	18	15	25	25
Totals for the District	556	341	507	801	785	446	348	245	477	362
MOHAWK VALLEY DISTRICT:										
Johnstown (Fulton Co.)	10	18	20	21	26	9	8	1	4	11
Gloversville (Fulton Co.)	22	21	23	39	36	18	17	2	26	28
Rest of county	16	19	20	23	34	11	8	1	13	25
Frankfort, village (Herkimer Co.)	2	3	4	5	8	1	2	6	2	2
Herkimer, village (Herkimer Co.)	5	6	17	14	9	6	10	9	7	11

Total Mortality for the Year 1909 in the Sanitary Districts
— (Continued)

SANITARY DISTRICTS	Other diseases of the genito-urinary system	The puerperal state	Diseases of the skin	Diseases of the organs of locomotion	Malformations	Early infancy (under three months)	External causes	Ill-defined diseases	BIRTHS	
									Total births	Still births
HUDSON VALLEY DIST.—(Cont'd)										
Warwick, town (Orange Co.)	1	3			2	6	6	2	123	3
Rest of county	14	7	4		7	18	74	10		
Cold Spring, village (Putnam Co.)					2	2	1	4	46	3
Rest of county	5	2	1		3	2	23	3		
Hoosick Falls, village Rensselaer Co.)	2	2	1			1	3	1	123	3
Rensselaer (Rensselaer Co.)	2				1	6	17	2	158	6
Troy Rensselaer Co.)	33	11	5	4	9	47	71	46	1,006	53
Rest of county	10	4	1		2	5	30	15		
Haverstraw, town (Rockland Co.)	4		1		3	4	5		136	3
Nyack, village (Rockland Co.)	1	1	1			1	4	1	69	2
Ramapo, town (Rockland Co.)	3	2	1		2	3	9	1	105	3
Spring Valley, village (Rockland Co.)	1				1		2	1	69	1
Suffern, village Rockland Co.)		2					9		43	1
Rest of county	5				4	3	21	6		
Ellenville, village (Ulster Co.)	2		1			2	2	4	45	0
Esopus, town (Ulster Co.)	1	1			1	2	5	2	80	6
Kingston (Ulster Co.)	14	2	4		2	14	38	12	499	15
Marbletown, town (Ulster Co.)	1						14	2	73	3
Rosendale, town (Ulster Co.)						1	6		70	0
Saugerties, village (Ulster Co.)						1	2	1	78	2
Rest of county	16	8	4	3	3	13	50	25		
Totals for the District	310	85	71	15	94	313	863	319		
ADIRONDACK AND NORTHERN DISTRICT:										
Plattsburg (Clinton Co.)	5	1	1			13	12	7	222	11
Rest of county	6	5	2	1	4	14	23	28		
Malone, village (Franklin Co.)	2		1			2	3	6	122	4
Saranac Lake, village (Franklin Co.)	1				1	2	1	3	94	5
Tupper Lake, village (Franklin Co.)		1			1	1	2	1	65	6
Rest of county	10	6	2		9	21	27	33		
Essex county	7	4	8		8	16	32	22		
Hamilton county			1			2	3	1		
Carthage, village (Jefferson Co.)		2	1			1	6	1	35	2
Clayton, town (Jefferson Co.)		1		1	2	2	7	2	81	0
Ellisburg, town (Jefferson Co.)			1			1	4	4	54	3
Watertown (Jefferson Co.)	9	6	2		4	8	32	10	519	23
Rest of county	12	3	5		5	13	23	23		
Lowville, town (Lewis Co.)							4	2	48	0
Rest of county	7	3	2		4	6	22	14		
Canton, town (St. Lawrence Co.)	2		2	1	1	3	2	4	91	9
Gouverneur, town (St. Lawrence Co.)	2	1			2	1	6	6	98	0
Massena, village (St. Lawrence Co.)	1				2	1	2	3	103	4
Ogdensburg (St. Lawrence Co.)	6	3		1	4	7	12	10	356	9
Potsdam, village (St. Lawrence Co.)			2		1	2	2	6	69	7
Rest of county	22	11	4		6	20	39	31		
Glens Falls (Warren Co.)	6	1			2	12	18	7	243	11
Rest of county	7	4	6		6	6	17	12		
Ft. Edward, town (Washington Co.)	2	2	2			1	5	2	126	4
Granville, town (Washington Co.)						1	4	4	115	5
Greenwich, town (Washington Co.)		1	4			1	5		66	2
Sandy Hill, village (Washington Co.)	1	2				3	4	1	91	6
Whitchall, village (Washington Co.)	1			1		1	3	2	130	2
Rest of county	5	2	3		4	3	16	8		
Totals for the District	115	59	49	5	66	166	336	253		
MOHAWK VALLEY DISTRICT:										
Johnstown (Fulton Co.)	4	1	3		2	2	3	7	161	4
Gloversville (Fulton Co.)	12	2	2		3	4	25	3	388	19
Rest of county	4	2	4	1	1	4	11	13		
Frankfort, village (Herkimer Co.)	1					2	4	2	120	2
Herkimer, village (Herkimer Co.)	2				3	4	8	2	162	2

Total Mortality for the Year 1909 in the Sanitary Districts
— (Continued)

SANITARY DISTRICTS	Population, U. S. census estimate 1909	AGES							
		Total deaths	Deaths under 1 year	Deaths 1 to 4 years	Deaths 5 to 19 years	Deaths 20 to 39 years	Deaths 40 to 59 years	Deaths at 60 years and over	
MOHAWK VALLEY DISTRICT—(Cont'd)									
Ilion, village (Herkimer Co.)	6,566	67	12	0	2	8	8	37	
Little Falls (Herkimer Co.)	11,563	183	40	8	12	30	39	50	
Rest of county	27,487	363	43	13	13	39	47	207	
Amsterdam (Montgomery Co.)	25,267	423	109	23	17	80	75	118	
Fort Plain, village (Montgomery Co.)	2,220	38	4	0	0	5	7	22	
Rest of county	23,861	322	37	6	15	34	58	111	
Boonville, town (Oneida Co.)	3,032	46	4	1	3	6	6	29	
Camden, town (Oneida Co.)	3,754	58	7	1	0	6	9	35	
Rome (Oneida Co.)	18,917	382	55	22	24	44	61	175	
Utica (Oneida Co.)	69,458	1,153	279	83	57	183	205	346	
Whitestown, town (Oneida Co.)	7,434	114	31	12	8	20	10	33	
Rest of county	41,073	862	65	23	56	101	151	404	
Ballston Spa, village (Saratoga Co.)	4,301	58	15	1	1	5	8	28	
Mechanicville, village (Saratoga Co.)	6,841	78	16	5	4	8	17	26	
Saratoga Springs, village (Saratoga Co.)	13,471	249	23	5	12	48	61	100	
Waterford, town (Saratoga Co.)	5,890	83	9	6	3	5	18	42	
Rest of county	33,407	480	69	12	15	56	79	247	
Schenectady (Schenectady Co.)	73,037	846	214	80	53	150	162	187	
Rest of county	9,881	142	2	5	6	15	28	67	
Cohoeskill, town (Schoharie Co.)	2,534	53	3	1	4	2	12	30	
Rest of county	21,760	344	22	12	12	19	45	224	
Totals for the District	466,973	7,116	1,207	350	360	955	1,265	2,963	
SOUTHERN TIER DISTRICT:									
Wellsville, village (Allegany Co.)	5,007	75	4	2	6	9	13	40	
Rest of county	39,654	529	55	13	17	43	62	309	
Binghamton (Broome Co.)	45,855	712	127	57	52	97	148	231	
Lestershire, village (Broome Co.)	4,790	48	9	0	2	10	8	18	
Rest of county	24,141	603	29	13	18	60	128	352	
Olean (Cattaraugus Co.)	18,000	211	39	13	15	26	30	78	
Salamanca, village (Cattaraugus Co.)	6,438	73	12	2	3	11	11	34	
Rest of county	46,626	581	73	21	27	53	82	325	
Dunkirk (Chautauque Co.)	18,061	282	49	9	13	33	42	56	
Fredonia, village (Chautauque Co.)	5,982	83	11	6	10	6	5	45	
Jamestown (Chautauque Co.)	28,495	343	46	19	23	56	55	144	
Westfield, village (Chautauque Co.)	3,144	57	9	6	2	7	6	26	
Rest of county	47,850	697	84	20	31	65	98	399	
Elmira (Chemung Co.)	35,765	546	53	26	28	71	111	227	
Horseheads, town (Chemung Co.)	4,729	89	9	3	2	12	17	45	
Rest of county	11,106	221	17	5	8	23	44	122	
Bath, village (Steuben Co.)	2,635	47	2	0	1	7	10	27	
Corning (Steuben Co.)	15,339	217	41	9	16	34	46	71	
Hornell (Steuben Co.)	14,126	185	16	3	9	31	49	77	
Rest of county	49,714	1,005	64	26	22	73	114	709	
Candor, town (Tioga Co.)	3,000	54	6	2	3	2	10	31	
Owego, village (Tioga Co.)	4,986	94	9	4	8	10	20	43	
Waverly, village (Tioga Co.)	5,283	71	12	2	0	11	11	35	
Rest of county	13,638	234	18	10	9	20	32	145	
Totals for the District	449,936	6,977	794	271	225	782	1,212	3,585	
EAST CENTRAL DISTRICT:									
Norwich, village (Chenango Co.)	8,216	137	22	8	9	15	27	56	
Rest of county	28,738	506	40	8	14	32	73	325	
Cortland (Cortland Co.)	12,538	162	29	2	5	22	54	70	
Homer, village (Cortland Co.)	2,653	47	4	1	0	9	4	35	
Rest of county	15,842	294	19	5	6	12	26	136	
Sidney, town (Delaware Co.)	4,361	68	6	1	5	10	5	38	
Walton, town (Delaware Co.)	5,699	70	7	7	5	8	4	39	
Rest of county	37,428	504	64	12	24	53	77	273	
Canastota, village (Madison Co.)	3,119	41	7	2	1	2	8	21	
Cazenovia, town (Madison Co.)	3,734	65	5	0	1	10	13	36	

Total Mortality for the Year 1909 in the Sanitary Districts
— (Continued)

SANITARY DISTRICTS	EPIDEMIC DISEASES								
	Typoid fever	Malarial diseases	Smallpox	Measles	Scarlatina	Whooping cough	Diphtheria and croup	Influenza	Erysipelas
MOHAWK VALLEY DIST.— (Cont'd)									Cerebro-spinal meningitis
Ilion, village (Herkimer Co.)					1		3	2	
Little Falls (Herkimer Co.)	1				1		2	3	1
Rest of county	5	1			1	1	9	3	2
Amsterdam (Montgomery Co.)	3				2				1
Fort Plain, village (Montgomery Co.)								1	
Rest of county	1	1					3	2	
Boonville, town (Oneida Co.)	1								
Camden, town (Oneida Co.)	1								
Rome (Oneida Co.)	3			1	2		3	7	2
Utica (Oneida Co.)	11	1		8	8	5	7	8	4
Whitestown, town (Oneida Co.)	1				3	1	1	1	
Rest of county	10			1		1	3	12	3
Ballston Spa, village (Saratoga Co.)									1
Mechanicville, village (Saratoga Co.)	1					1			1
Saratoga Springs, village (Saratoga Co.)						1	1	7	2
Waterford, town (Saratoga Co.)	1			1					
Rest of county	8	1		2		3	2	13	1
Schenectady (Schenectady Co.)	8			1	2	4	8	7	3
Rest of county					1			1	
Coldest Hill, town (Schoharie Co.)	2								
Rest of county	3				5	1	1	4	1
Totals for the District	63	5		12	47	33	53	77	21
SOUTHERN TIER DISTRICT									
Wellsville, village (Allegany Co.)	5					1	1	1	
Rest of county	7	1		2	2	3	3	13	2
Binghamton (Broome Co.)	6	1		4	2	9	18	3	2
Iestershire, village (Broome Co.)									3
Rest of county	5				2	2	3	13	2
Olean (Cattaraugus Co.)	2				3	2	1	3	1
Salamanca, village (Cattaraugus Co.)		1					3		1
Rest of county	11			5	1	2	1	12	1
Dunkirk (Chautauqua Co.)	2				1		3		
Fredonia, village (Chautauqua Co.)	1						11	1	
Jamestown (Chautauqua Co.)	5	1			2	1	13	4	1
Westfield, village (Chautauqua Co.)							3	2	
Rest of county	7	1				5	5	23	3
Elmira (Chemung Co.)	12			4	6	2	2	8	4
Horseheads, town (Chemung Co.)									1
Rest of county	6					1	1	5	1
Bath, village (Steuben Co.)	1								
Corning (Steuben Co.)	19			2	1			1	
Horrell (Steuben Co.)	3								
Rest of county	6	1		3	1	1	2	14	6
Candor, town (Tioga Co.)							1		
Owego, village (Tioga Co.)					1			3	
Waverly, village (Tioga Co.)	1						1	2	
Rest of county	2					2	2	9	1
Totals for the District	101	6		20	22	2	71	120	25
EAST CENTRAL DISTRICT									
Norwich, village (Chenango Co.)					2		2	2	
Rest of county	7				1	2		13	1
Cortland (Cortland Co.)	2								
Homer, village (Cortland Co.)	1							2	
Rest of county	1					1		7	
Sidney, town (Delaware Co.)	2				1	2		3	1
Walton, town (Delaware Co.)					1	1		5	
Rest of county	3				1	3	4	4	2
Canastota, village (Madison Co.)								1	
Cazenovia, town (Madison Co.)								3	

Total Mortality for the Year 1909 in the Sanitary Districts
— (Continued) —

SANITARY DISTRICTS	Pulmonary tuberculosis	Cancer	Other general diseases	Diseases of the nervous system	Diseases of the circulatory system	Pneumonia	Other diseases of the respiratory system	Diarrhea and enteritis (under 2 years)	Other diseases of the digestive system	Bright's disease
MOHAWK VALLEY DIST.—(Cont'd)										
Ilion, village (Herkimer Co.)	4	5	1	15	5	4	3	4	7	5
Little Falls (Herkimer Co.)	18	9	18	17	17	14	7	14	10	6
Rest of county	22	18	29	48	59	21	20	7	22	31
Amsterdam (Montgomery Co.)	58	25	33	47	40	52	17	50	28	25
Fort Plain, village (Montgomery Co.)	1	3	8	7	4	2	1	5	5	3
Rest of county	34	27	27	48	34	21	12	5	17	34
Boonville, town (Oneida Co.)	1	5	3	9	13	5	3	1	1	2
Camden, town (Oneida Co.)	4	3	3	7	15	4	3	1	2	3
Rome (Oneida Co.)	21	19	28	48	63	22	10	16	29	29
Utica (Oneida Co.)	111	53	109	111	104	80	67	91	95	78
Whitestown, town (Oneida Co.)	11	4	8	13	11	14	2	11	5	4
Rest of county	74	29	71	118	112	59	49	16	59	76
Ballston Spa, village (Saratoga Co.)	5	6	6	5	11	4	6	9	8	9
Mechanicville, village (Saratoga Co.)	9	6	6	7	8	3	1	4	3	3
Saratoga Spgs., village (Saratoga Co.)	16	17	12	36	44	10	15	2	21	26
Waterford, town (Saratoga Co.)	8	5	6	6	18	5	4	4	6	3
Rest of county	34	35	26	78	54	22	28	14	33	43
Schenectady (Schenectady Co.)	86	31	83	74	76	60	54	75	69	62
Rest of county	12	6	11	24	17	5	7	5	7	10
Cobleskill, town (Schoharie Co.)	3	3	7	9	5	3	1	3	2	6
Rest of county	19	30	30	47	57	22	18	6	23	21
Totals for the District	585	397	601	877	883	469	373	357	498	554
SOUTHERN TIER DISTRICT:										
Wellsville, village (Allegany Co.)	2	5	4	5	9	3	8	11	5	5
Rest of county	21	28	32	70	95	38	19	46	38	28
Binghamton (Broome Co.)	26	30	67	82	79	58	30	25	53	58
Lestershire, village (Broome Co.)	6	3	4	7	4	3	2	7	2	2
Rest of county	47	30	40	95	87	34	46	6	57	41
Olean (Cattaraugus Co.)	9	12	20	32	16	16	8	9	23	11
Salamanca, village (Cattaraugus Co.)	2	5	9	11	10	4	5	2	5	5
Rest of county	23	46	57	88	42	35	30	10	40	40
Dunkirk (Chautauque Co.)	10	12	27	17	28	16	7	7	18	11
Fredonia, village (Chautauque Co.)	2	5	9	9	19	3	4	4	9	9
Jamestown (Chautauque Co.)	18	25	37	50	33	28	15	10	28	23
Westfield, village (Chautauque Co.)	4	4	4	6	1	4	4	6	6	5
Rest of county	32	42	52	91	119	42	44	17	60	33
Elmira (Chemung Co.)	34	25	57	58	79	30	35	14	36	67
Horseheads, town (Chemung Co.)	11	5	9	10	17	7	4	4	5	3
Rest of county	19	13	19	24	36	15	8	3	21	16
Bath, village (Steuben Co.)	3	2	1	6	9	2	1	7	3	5
Corning (Steuben Co.)	12	9	13	18	30	19	10	7	18	11
Hornell (Steuben Co.)	12	9	15	26	34	10	7	1	12	10
Rest of county	47	77	71	139	173	34	72	17	79	86
Candor, town (Tioga Co.)	1	5	3	13	6	3	1	1	6	4
Owego, village (Tioga Co.)	4	4	11	15	8	5	7	1	13	10
Waverly, village (Tioga Co.)	3	6	7	14	6	2	4	2	6	3
Rest of county	8	10	14	41	28	10	7	25	14	14
Totals for the District	362	412	582	919	1,023	415	377	152	587	496
EAST CENTRAL DISTRICT:										
Norwich, village (Chenango Co.)	9	12	12	14	19	14	9	6	2	17
Rest of county	18	23	40	89	79	37	30	5	37	43
Cortland (Cortland Co.)	6	8	2	17	20	12	5	1	13	25
Homer, village (Cortland Co.)	2	2	1	13	7	2	4	3	3	1
Rest of county	11	17	8	28	30	13	8	4	19	17
Sidney, town (Delaware Co.)	1	7	4	16	4	2	1	1	6	5
Walton, town (Delaware Co.)	3	5	8	12	1	6	3	5	4	4
Rest of county	31	28	33	80	67	43	27	8	40	33
Canastota, village (Madison Co.)	1	3	8	8	8	3	2	2	3	3
Cazenovia, town (Madison Co.)	5	6	6	10	13	2	2	4	4	4

Total Mortality for the Year 1909 in the Sanitary Districts
— (Continued)

SANITARY DISTRICTS	Other diseases of the genito-urinary system	The puerperal state	Diseases of the skin	Diseases of the organs of locomotion	Malformations	Early infancy (under three months)	External causes	Ill-defined diseases	BIRTHS	
									Total births	Still births
MOHAWK VALLEY DIST.—(Cont'd)										
Ilion, village (Herkimer Co.)	2	1			1	2	1	7	120	6
Little Falls (Herkimer Co.)	6	1	1			6	23	7	323	5
Rest of county	3	2	7	1	5	8	19	26		
Amsterdam (Montgomery Co.)	10	7	3		2	11	28	12	749	8
Fort Plain, village (Montgomery Co.)	1						2	1	4	0
Rest of county	8	2			2	10	14	20		
Roonville, town (Oneida Co.)	1		1			1	1	2	52	6
Camden, town (Oneida Co.)	2	2			2		2	4	62	3
Rome (Oneida Co.)	8	4	5	1	1	6	29	12	481	10
Utica (Oneida Co.)	39	14	4	1	14	30	78	14	1,916	108
Whitestown, town (Oneida Co.)	3	2			4	5	7	2	164	7
Rest of county	15	5	6	2	9	7	39	24		
Ballston Spa, village (Saratoga Co.)	1					2		3	68	1
Mechanicville, village (Saratoga Co.)	14	2				5	6	2	182	9
Saratoga Springs, vil. (Saratoga Co.)	9	6	1		1	3	17	2	246	16
Waterford, town (Saratoga Co.)	3						6	6	102	0
Rest of county	9	5	7		7	5	18	22		
Schenectady (Schenectady Co.)	14	9	5	2	15	19	54	6	1,801	61
Rest of county	4	2		1	3	6	16	3		
Cobleskill, town (Schoharie Co.)						1	4	4	53	4
Rest of county	11		3	2		7	18	14		
Totals for the District	176	69	52	11	75	150	433	220		
SOUTHERN TIER DISTRICT:										
Wellsville, village (Allegany Co.)	1					3	4	7	62	2
Rest of county	23	7	3		3	9	29	25		
Pinghamton (Broome Co.)	23	8	5	2	4	22	59	17	943	39
Lestershire, village (Broome Co.)	2				2		3		72	2
Rest of county	17	1	5	1	3	7	36	23		
Olean (Cattaraugus Co.)	4	4				3	21	9	331	14
Salamanca, village (Cattaraugus Co.)		2			1		9	3	141	6
Rest of county	10	4	6	2	5	10	27	18		
Dunkirk (Chautauqua Co.)	3	4		1	2	8	21	4	624	18
Fredonia, village (Chautauqua Co.)	1				1	2	2	2	115	6
Jamestown (Chautauqua Co.)	6	2	1	1	4	5	21	9	594	20
Westfield, village (Chautauqua Co.)	1	2	1		1	4	9		60	2
Rest of county	19	7	5	1	7	9	41	35		
Elmira (Chemung Co.)	18	3	1		4	5	38	4	537	30
Horseheads, town (Chemung Co.)	2	2	1			1	4	6	63	2
Rest of county	12	1				2	14	4		
Bath, village (Steuben Co.)	3					1	7	3	34	0
Corning (Steuben Co.)	5	5	1	1	2	7	17	9	271	13
Hornell (Steuben Co.)	9	3	2		3	1	17	8	301	5
Rest of county	28	4	23	2	3	8	51	66		
Candor, town (Tioga Co.)							1	9	48	0
Owego, village (Tioga Co.)				1			9	2	43	0
Waverly, village (Tioga Co.)	4	1			1	2	5	1	64	6
Rest of county	7	2	5		2	6	22	12		
Totals for the District	201	63	59	13	48	115	467	276		
EAST CENTRAL DISTRICT:										
Norwich, village (Chenango Co.)	1	1	1		2	5	5		138	
Rest of county	19	2	2		7	7	23	19		
Cortland (Cortland Co.)	1		1			1	1	2	236	
Homer, village (Cortland Co.)		1	1		2	1	3	2	38	2
Rest of county	5				2	6	12	4		
Sidney, town (Delaware Co.)	2		1			2	3	5	66	4
Walton, town (Delaware Co.)	1			1	1	2	4	2	96	2
Rest of county	12	7	3		5	12	31	26		
Canastota, village (Madison Co.)	1					3	3	1	80	0
Cazenovia, town (Madison Co.)		1	1				3	2	45	0

Total Mortality for the Year 1909 in the Sanitary Districts
— (Continued)

SANITARY DISTRICTS	Population, U. S. census estimate 1909	AGES						
		Total deaths	Deaths under 1 year	Deaths 1 to 4 years	Deaths 5 to 19 years	Deaths 20 to 39 years	Deaths 40 to 59 years	Deaths at 60 years and over
EAST CENTRAL DISTRICT—(Continued)								
Hamilton, town (Madison Co.).....	3,508	84	6	4	2	7	11	54
Oneida (Madison Co.).....	10,990	139	9	6	4	12	32	76
Rest of county.....	19,330	207	21	6	5	29	46	154
Baldwinsville, village (Onondaga Co.).....	2,938	37	3	0	1	3	7	22
DeWitt, town (Onondaga Co.).....	3,526	44	3	4	2	3	4	27
East Syracuse, village (Onondaga Co.).....	3,383	28	7	2	0	8	12	9
Solvay, village (Onondaga Co.).....	4,770	63	21	7	9	6	8	12
Syracuse (Onondaga Co.).....	125,378	1,947	402	193	110	316	410	616
Rest of county.....	46,242	845	74	21	21	80	133	469
Cooperstown, village (Otsego Co.).....	2,510	55	6	1	6	4	15	23
Oneonta (Otsego Co.).....	8,794	152	20	5	9	30	27	61
Worcester, town (Otsego Co.).....	2,242	29	5	2	0	5	8	19
Rest of county.....	34,643	487	40	13	22	33	75	303
Liberty, town (Sullivan Co.).....	6,240	152	9	4	7	16	31	25
Rest of county.....	30,553	476	52	23	25	76	96	206
Totals for the District.....	425,973	6,619	881	273	285	855	1,189	3,145
WEST CENTRAL DISTRICT:								
Auburn (Cayuga Co.).....	34,272	499	81	17	26	74	107	194
Rest of county.....	31,027	553	38	13	18	56	82	342
Batavia, village (Genesee Co.).....	10,855	179	30	8	11	29	32	69
Le Roy, village (Genesee Co.).....	3,900	57	4	3	4	9	7	30
Rest of county.....	22,515	299	35	10	10	27	48	169
Danville, village (Livingston Co.).....	4,133	50	6	1	2	1	10	30
Mt. Morris, village (Livingston Co.).....	2,775	45	8	5	2	8	5	16
Rest of county.....	29,542	500	42	13	45	165	71	222
Canandaigua, village (Ontario Co.).....	8,296	128	14	5	4	15	24	66
Geneva (Ontario Co.).....	12,543	175	25	3	5	31	28	72
Manchester, town (Ontario Co.).....	4,871	86	5	3	2	9	22	45
Phelps, town (Ontario Co.).....	4,732	66	9	2	4	7	8	36
Rest of county.....	22,711	297	34	9	5	20	48	181
Hector, town (Schuyler Co.).....	3,685	49	4	1	1	2	10	31
Rest of county.....	11,437	158	10	3	4	21	20	89
Seneca Falls, village (Seneca Co.).....	6,908	101	13	3	4	10	17	54
Waterloo, village (Seneca Co.).....	4,914	72	5	4	4	6	10	43
Rest of county.....	14,362	357	22	9	14	40	89	178
Ithaca (Tompkins Co.).....	15,581	211	21	11	13	21	48	87
Rest of county.....	18,723	288	17	9	7	24	56	181
Perry, village (Wyoming Co.).....	4,554	50	11	4	1	3	3	28
Warsaw, town (Wyoming Co.).....	4,574	49	5	0	2	6	9	27
Rest of county.....	22,979	320	41	8	14	38	50	168
Penn Yan, village (Yates Co.).....	4,385	78	6	4	4	8	12	44
Rest of county.....	15,623	189	18	4	5	18	24	120
Totals for the District.....	320,101	4,876	504	152	211	598	855	2,522
LAKE ONTARIO AND WESTERN DISTRICT:								
Amherst, town (Erie Co.).....	4,714	47	3	2	2	9	8	33
Buffalo (Erie Co.).....	396,525	6,111	1,253	550	478	980	1,234	1,616
DeWey, village (Erie Co.).....	3,642	57	23	8	2	14	4	6
East Aurora, village (Erie Co.).....	2,510	37	4	1	3	3	6	20
Lackawanna (Erie Co.).....	11,370	150	97	25	2	12	9	5
Lancaster, village (Erie Co.).....	3,928	29	12	5	1	7	3	11
Tonawanda (Erie Co.).....	7,315	105	16	3	8	16	17	45
West Seneca, town (Erie Co.).....	11,364	183	90	9	9	18	22	35
Rest of county.....	64,294	831	116	49	43	108	124	385
Brookport, village (Monroe Co.).....	2,812	57	5	8	4	4	8	28
Fairport, village (Monroe Co.).....	2,687	45	5	0	1	5	7	27
Rochester (Monroe Co.).....	196,793	2,913	440	223	168	492	639	953
Rest of county.....	52,405	858	124	41	41	97	151	399
Lockport (Niagara Co.).....	18,105	276	34	9	27	39	57	109

Total Mortality for the Year 1909 in the Sanitary Districts
— (Continued)

SANITARY DISTRICTS	EPIDEMIC DISEASES								
	Typhoid fever	Malarial diseases	Smallpox	Measles	Scarlatina	Whooping cough	Diphtheria and group	Influenza	Erysipelas
EAST CENTRAL DISTRICT—(Cont'd)									
Hamilton, town (Madison Co.)				1			1	1	
Oneida (Madison Co.)									1
Rest of county	1				1			6	2
Baldwinsville, village (Onondaga Co.)									
DeWitt, town (Onondaga Co.)								1	1
East Syracuse, village (Onondaga Co.)						1			
Solvay, village (Onondaga Co.)				1			2		
Syracuse (Onondaga Co.)	14				15	35	26	13	5
Rest of county	13				2	7	3	21	3
Cooperstown, village (Otsego Co.)	4								
Oneonta (Otsego Co.)	7			1	1		2		
Worcester, town (Otsego Co.)							1	2	
Rest of county	3				1			10	2
Liberty, town (Sullivan Co.)	2					1			1
Rest of county	7			1	2	5	1	10	1
Totals for the District	68			4	29	58	43	106	17
WEST CENTRAL DISTRICT:									
Auburn (Cayuga Co.)	6					2	3	1	1
Rest of county	3				1	3		15	2
Batavia, village (Genesee Co.)					2	2	2	4	
Le Roy, village (Genesee Co.)	1				2			1	
Rest of county				1		2	5	8	2
Dansville, village (Livingston Co.)									1
Mt. Morris, village (Livingston Co.)	1						1		
Rest of county					2	1		8	2
Canandaigua, village (Ontario Co.)	2	1						3	
Geneva (Ontario Co.)	2					1	1	4	
Manchester, town (Ontario Co.)								2	
Phelps, town (Ontario Co.)								1	
Rest of county	2			3		3	2	6	2
Hector, town (Schuyler Co.)	2								
Rest of county						1		3	1
Seneca Falls, village (Seneca Co.)	2						2	1	1
Watkins, village (Seneca Co.)	1	1					2		1
Rest of county	1					2		4	1
Ithaca (Tompkins Co.)	3				2		6	3	
Rest of county	3				1	1	1	10	
Perry, village (Wyoming Co.)					1				
Warsaw, town (Wyoming Co.)	1			1				2	1
Rest of county	2					2		9	
Penn Yan, village (Yates Co.)									
Rest of county	5	1						6	
Totals for the District	44	3		5	11	20	25	91	16
LAKE ONTARIO AND WESTERN DISTRICT:									
Amherst, town (Erie Co.)	2							1	
Buffalo (Erie Co.)	96			77	168	14	102	12	12
Depew, village (Erie Co.)	1				2	1	2		1
East Aurora, village (Erie Co.)									1
Lackawanna (Erie Co.)					3		1	1	
Lawson, village (Erie Co.)	1				2		1		
Tonawanda (Erie Co.)	2						2	3	
West Seneca, town (Erie Co.)					3		1		1
Rest of county	9			1	5	3	5	21	1
Brockport, village (Monroe Co.)								2	4
Fairport, village (Monroe Co.)						1		3	
Rochester (Monroe Co.)	17			32	20	22	29	7	4
Rest of county	5	1		2	2	4	6	2	2
Lockport (Niagara Co.)	9				4	1	3	6	2

Total Mortality for the Year 1909 in the Sanitary Districts
— (Continued)

SANITARY DISTRICTS	Pulmonary tuberculosis	Cancer	Other general diseases	Diseases of the nervous system	Diseases of the circulatory system	Pneumonia	Other diseases of the respiratory system	Diarrhea and enteritis (under 2 years)	Other diseases of the digestive system	Bright's disease
EAST CENTRAL DIST.—(Cont'd)										
Hamilton, town (Madison Co.).....	3	1	7	8	2	14	4	1	6	6
Oneida (Madison Co.).....	5	10	11	23	24	15	5	2	16	4
Rest of county.....	15	15	26	13	51	26	9	6	25	18
Paldineville, vil. (Onondaga Co.)...	3	1	5	5	5	2	2	1	2	4
DeWitt, town (Onondaga Co.).....	1	2	6	3	8	6	2	7	4	5
East Syracuse vil. (Onondaga Co.)...	3	2	2	7	2	2	2	3	3	1
Solvay, village (Onondaga Co.).....	3	1	4	2	7	5	5	7	4	5
Syracuse (Onondaga Co.).....	145	114	198	187	274	118	76	136	136	153
Rest of county.....	57	51	68	94	137	44	12	20	50	53
Cooperstown, village (Otsego Co.)...	1	5	7	7	7	4	1	1	6	4
Oneonta (Otsego Co.).....	11	7	15	9	19	5	8	5	16	9
Worcester, town (Otsego Co.).....	2	2	3	5	5	3	3	1	2	5
Rest of county.....	18	41	17	66	86	43	17	4	52	39
Liberty, town (Sullivan Co.).....	88	2	5	10	8	2	6	2	2	7
Rest of county.....	70	18	46	38	66	37	20	13	42	21
Totals for the District.....	512	382	581	525	980	460	288	234	474	468
WEST CENTRAL DISTRICT:										
Aurum (Cayuga Co.).....	24	31	29	69	67	29	25	42	35	34
Rest of county.....	32	42	44	76	78	23	25	7	45	43
Batavia, village (Genesee Co.).....	8	7	29	10	12	13	12	6	10	14
Le Roy, village (Genesee Co.).....	6	8	8	8	8	3	1	2	5	2
Rest of county.....	22	9	21	16	30	16	22	8	21	28
Danville, village (Livingston Co.)...	2	3	2	8	10	1	2	3	3	5
Mt. Morris, village (Livingston Co.)...	1	3	5	3	6	1	10	1	3	2
Rest of county.....	58	23	26	96	77	26	31	9	42	34
Canandaigua, village (Ontario Co.)...	4	8	13	19	15	12	4	1	15	5
Geneva (Ontario Co.).....	15	7	12	18	25	19	8	4	10	9
Manchester, town (Ontario Co.).....	2	9	9	8	12	9	6	8	8	7
Phelps, town (Ontario Co.).....	2	4	10	12	7	4	2	3	4	7
Rest of county.....	17	17	22	51	28	19	19	2	23	23
Hector, town (Schuyler Co.).....	1	5	2	12	8	1	3	1	4	1
Rest of county.....	8	19	11	29	15	6	7	1	16	10
Seneca Falls, village (Seneca Co.).....	8	6	14	18	21	7	1	2	1	6
Waterloo, village (Seneca Co.).....	5	6	6	8	17	5	2	5	5	1
Rest of county.....	44	18	25	46	62	23	22	6	34	30
Ithaca (Tompkins Co.).....	13	14	25	22	2	10	6	6	13	28
Rest of county.....	21	20	22	43	42	12	14	5	16	18
Perry, village (Wyoming Co.).....	2	1	5	6	13	1	1	2	6	1
Warsaw, town (Wyoming Co.).....	1	2	5	5	8	4	1	1	2	3
Rest of county.....	10	24	34	28	49	21	15	11	28	17
Penn Yan, village (Yates Co.).....	7	3	3	10	13	6	6	3	12	3
Rest of county.....	10	6	14	30	21	10	9	2	13	16
Totals for the District.....	335	296	410	605	679	274	256	128	374	347
LAKE ONTARIO AND WESTERN DISTRICT:										
Amherst, town (Erie Co.).....	2	7	4	7	5	1	1	3	4	4
Buffalo (Erie Co.).....	523	271	632	664	796	228	608	240	480	236
Depew, village (Erie Co.).....	4	1	3	3	9	2	9	7	2	2
East Aurora, village (Erie Co.).....	3	1	4	5	9	2	3	1	2	1
Lackawanna (Erie Co.).....	22	1	17	4	7	12	6	48	5	1
Lancaster, village (Erie Co.).....	6	6	3	5	5	2	3	5	1	2
Tonawanda (Erie Co.).....	19	6	4	20	20	5	3	3	11	2
West Seneca, town (Erie Co.).....	12	4	31	19	12	11	12	17	8	2
Rest of county.....	51	42	59	106	120	65	40	36	55	46
Brockport, village (Monroe Co.).....	5	1	5	5	8	7	4	2	1	3
Fairport, village (Monroe Co.).....	1	1	3	9	4	2	4	3	2	5
Rochester (Monroe Co.).....	282	172	190	311	377	178	196	179	222	229
Rest of county.....	52	38	52	136	125	57	53	52	59	30
Lockport (Niagara Co.).....	23	15	21	36	23	20	17	6	16	10

Total Mortality for the Year 1909 in the Sanitary Districts
— (Continued)

SANITARY DISTRICTS	Other diseases of the genito-urinary system	The puerperal state	Diseases of the skin	Diseases of the organs of locomotion	Malformations	Early infancy (under three months)	External causes	Ill-defined diseases	BIRTHS	
									Total births	Still births
EAST CENTRAL DIST.—(Cont'd)										
Hanilton, town (Madison Co.)	4			1	2		5	1	54	5
Oneida (Madison Co.)	3	2	3			1	11	5	138	4
Rest of county	6	3	3	1		4	13	2		
Baldwinsville, village (Onondaga Co.)						1	6		22	1
DeWitt, town (Onondaga Co.)	1				1		4	1	40	3
Fast Syracuse, village (Onondaga Co.)	1						4	4	70	1
Solvay, village (Onondaga Co.)					1	2	5	4	83	4
Syracuse (Onondaga Co.)	53	21	13	5	21	47	129	72	2,654	123
Rest of county	16	3	4	1	6	12	56	4		
Cooperstown, village (Otsego Co.)	3	1	1				3		38	3
Oneonta (Otsego Co.)	4	2			2	3	9	6	137	4
Worcester, town (Otsego Co.)	2						4	1	36	1
Rest of county	14	2	6		2	4	24	25		
Liberty, town (Sullivan Co.)	2	1	1	1		3	4	4	98	1
Rest of county	4	8	2	1	3	5	26	24		
Totals for the District	158	55	44	12	58	127	407	230		
WEST CENTRAL DISTRICT:										
Auburn (Cayuga Co.)	10	7	5		7	7	27	18	615	36
Rest of county	16	3	8	1	5	7	46	27		
Batavia, village (Genesee Co.)	12	1	2			6	17	6	227	4
Le Roy, village (Genesee Co.)	2		3				4	2	43	2
Rest of county	7	4	2		1	6	10	17		
Dansville, village (Livingston Co.)	5			1		1	2	1	62	1
Mt. Morris, village (Livingston Co.)							5	2	44	3
Rest of county	7	2	2	1	1	7	3	19		
Canandaigua, village (Ontario Co.)	4	1	3			2	9	6	117	5
Geneva (Ontario Co.)	5	1			4	8	16	7	255	8
Manchester, town (Ontario Co.)	3					1	6	3	88	4
Phelps, town (Ontario Co.)	2	1	1		1	2	2	1	79	5
Rest of county	3	2	1		2	1	17	15		
Hector, town (Schuyler Co.)	1				2		5	1	49	5
Rest of county	7	2	1				16	11		
Seneca Falls, village (Seneca Co.)	3		1		1		3	4	128	0
Waterloo, village (Seneca Co.)	1	1					4	6	60	3
Rest of county	3	1			1	1	19	14		
Ithaca (Tompkins Co.)	5	2	1		3	6	11	5	291	8
Rest of county	5	1	1		1	2	22	18		
Perry, village (Wyoming Co.)	3				2	1	3	2	68	0
Warsaw, town (Wyoming Co.)	4		1		2	1	1	3	70	0
Rest of county	8	5	2		2	4	20	19		
Penn Yan, village (Yates Co.)			1			1	1	7	46	0
Rest of county	4				3	2	15	12		
Totals for the District	120	34	35	4	39	67	220	226		
LAKE ONTARIO AND WESTERN DISTRICT:										
Amherst, town (Erie Co.)	1		1			1	4	2	72	1
Buffalo (Erie Co.)	135	115	2	6	46	67	378	195	9,027	423
Drew, village (Erie Co.)	2	1				4	5	3	144	0
East Aurora, village (Erie Co.)			1			1	1	2	51	0
Lackawanna (Erie Co.)	1				1	5	14	1	170	9
Lancaster, village (Erie Co.)						1	4		86	2
Tonawanda (Erie Co.)	2				1	1	8	3	152	9
West Seneca, town (Erie Co.)	8	2				12	22	6	278	5
Rest of county	9	8	8	1	7	14	52	17		
Proctor, village (Monroe Co.)	2	1			1		7	3	55	4
Fairport, village (Monroe Co.)	1					2	2	5	47	0
Rochester (Monroe Co.)	66	37	19	5	27	41	166	64	4,287	223
Rest of county	19	3	11		5	16	83	39		
Lockport (Niagara Co.)	6	3			3	9	28	16	874	24

Total Mortality for the Year 1909 in the Sanitary Districts
— (Concluded)

SANITARY DISTRICTS	Population, U. S. census estimate 1909	Total deaths	AGES					
			Deaths under 1 year	Deaths 1 to 4 years	Deaths 5 to 19 years	Deaths 20 to 39 years	Deaths 40 to 59 years	Deaths at 60 years and over
LAKE ONTARIO AND WESTERN DISTRICT—(Continued)								
Niagara Falls (Niagara Co.)	32,012	465	127	35	26	105	91	81
North Tonawanda (Niagara Co.)	10,987	162	55	21	15	11	28	32
Rest of county	31,464	441	64	23	19	41	75	217
Albion, village (Orleans Co.)	5,743	64	8	5	5	8	11	26
Medina, village (Orleans Co.)	5,138	98	10	5	9	18	15	41
Rest of county	21,066	287	41	8	10	26	47	151
Fulton (Oswego Co.)	11,759	157	22	11	19	16	22	82
Oswego (Oswego Co.)	22,523	336	73	16	6	38	72	121
Richland, town (Oswego Co.)	3,673	48	5	2	2	4	7	28
Rest of county	22,150	566	66	9	29	50	78	314
Clyde, village (Wayne Co.)	2,589	41	3	2	2	6	6	25
Lyons, village (Wayne Co.)	5,132	86	6	3	3	11	25	38
Newark, village (Wayne Co.)	4,534	84	7	2	5	15	16	39
Palmyra, town (Wayne Co.)	4,274	57	6	2	1	5	6	37
Rest of county	22,035	523	68	28	29	72	77	268
Totals for the District	1,003,865	15,134	2,782	1,105	963	2,216	2,845	5,199
Totals for the State	8,699,643	140,261	26,077	12,211	7,602	22,519	28,349	42,298

Total Mortality for the Year 1909 in the Sanitary Districts
— (Concluded)

SANITARY DISTRICTS	EPIDEMIC DISEASES									
	Typhoid fever	Malarial diseases	Smallpox	Measles	Scarlatina	Whooping cough	Diphtheria and croup	Influenza	Erysipelas	Cerebro-spinal meningitis
LAKE ONTARIO AND WESTERN DISTRICT — (Continued)										
Niagara Falls (Niagara Co.)	21			2	5		9	3	1	1
North Tonawanda (Niagara Co.)	6			1	3	1	7	1		
Rest of county	6				4		1	8		
Alton, village (Orleans Co.)					2		1			
Medina, village (Orleans Co.)				1	1	1		1		
Rest of county	2			1	1	1		5	1	1
Fulton (Oswego Co.)						4	1	4		
Oswego (Oswego Co.)	6					5		3	1	
Richland, town (Oswego Co.)					1		1	1		
Rest of county	6	1			1	3		19	2	1
Clyde, village (Wayne Co.)								1	1	
Lyons, village (Wayne Co.)	2							2		2
Newark, village (Wayne Co.)						2	1			
Palmyra, town (Wayne Co.)										1
Rest of county	6			2		4	5	10		2
Totals for the District	290	2		119	227	67	177	119	28	30
Totals for the State	1,315	78	4	1,272	1,205	783	2,313	1,122	42	485

Total Mortality for the Year 1909 in the Sanitary Districts
— (Concluded)

SANITARY DISTRICTS	Pulmonary tuberculosis	Cancer	Other general diseases	Diseases of the nervous system	Diseases of the circulatory system	Pneumonia	Other diseases of the respiratory system	Diarrhea and enteritis (under 2 years)	Other diseases of the digestive system	Bright's disease
LAKE ONTARIO AND WESTERN DISTRICT — (Continued)										
Niagara Falls (Niagara Co.)	34	10	51	39	41	40	2	41	22	20
North Tonawanda (Niagara Co.)	8	10	7	19	16	18	11	12	10	4
Rest of county	35	21	45	60	61	28	2	13	20	27
Albion, village (Orleans Co.)	7	2	5	5	8	4	7	2	3	6
Medina, village (Orleans Co.)	10	4	8	8	11	4	5	4	13	12
Rest of county	28	21	16	28	44	17	12	9	15	18
Fulton (Oswego Co.)	8	2	13	23	22	14	5	9	16	13
Oswego (Oswego Co.)	22	23	33	44	33	22	9	17	35	23
Rickland, town (Oswego Co.)	3	6	4	9	7	2	1		4	2
Rest of county	25	25	40	77	91	33	2	8	46	40
Clyde, village (Wayne Co.)	5	3	2	4	11	4			2	2
Lyons, village (Wayne Co.)	1	11	6	8	10	4	5	1	5	6
Newark, village (Wayne Co.)	5	7	7	14	11	9	1	3	8	5
Palmira, town (Wayne Co.)	3	4	2	6	15	2	3	2	2	6
Rest of county	24	24	50	77	63	38	31	14	29	36
Totals for the District	1,213	733	1,319	1,762	1,952	832	1,127	732	1,106	862
Totals for the State	13,996	7,060	10,913	11,191	18,784	9,423	11,406	7,873	8,791	9,393

Total Mortality for the Year 1909 in the Sanitary Districts
— (Concluded)

SANITARY DISTRICTS	Other diseases of the genito-urinary system	The puerperal state	Diseases of the skin	Diseases of the organs of locomotion	Malformations	Early infancy (under three months)	External causes	Ill-defined diseases	BIRTHS	
									Total births	Still births
LAKE ONTARIO AND WESTERN DISTRICT—(Continued)										
Niagara Falls (Niagara Co.)	7	4	1	2	5	12	53	13	646	36
North Tonawanda (Niagara Co.)	3	1			4	2	16	2	327	13
Rest of county	10	1	4	1	2	11	34	15		
Allion, village (Orleans Co.)	2		1		1	1	3	4	80	1
Medina, village (Orleans Co.)	2	1				1	0	1	92	7
Rest of county	6			2	3	7	16	21		
Fulton (Oswego Co.)	4	2	2			4	10	10	219	7
Oswego (Oswego Co.)	15	2	2	1	3	6	21	10	481	12
Richland, town (Oswego Co.)	1	2				1	1	2	62	3
Rest of county	12	5	9	1	6	14	44	21		
Clyde, village (Wayne Co.)	2						2	2	60	1
Lyons, village (Wayne Co.)	4	1					13	5	78	3
Newark, village (Wayne Co.)	1	2					5	3	96	10
Palmira, town (Wayne Co.)	1					2	5	3	75	7
Rest of county	10	6	5		3	11	45	24		
Totals for the District	331	198	68	19	118	216	1,111	496		
Totals for the State	2,803	1,333	649	290	1,240	3,539	9,232	3,336	22,656	10,069

Total Mortality in Cities for the Year 1909

	Population, U. S. census estimate 1909	Total deaths	Annual death rate per 1000 population	AGES						
				Deaths under 1 year	Deaths 1 to 4 years	Deaths 5 to 19 years	Deaths 20 to 39 years	Deaths 40 to 59 years	Deaths at 60 years and over	
<i>City of New York</i>	4,450,963	74,105	16.6	15,944	8,552	4,250	13,474	16,035	15,852	
BOROUGH OF MANHATTAN.....	2,305,190	37,961	16.5	8,893	4,490	1,986	6,802	8,407	7,587	
BOROUGH OF THE BRONX.....	128,400	6,426	19.6	987	561	444	1,002	1,494	1,336	
BOROUGH OF BROOKLYN.....	1,505,925	24,365	16.2	4,925	2,957	1,471	4,213	5,045	5,749	
BOROUGH OF QUEENS.....	223,769	3,828	16.4	843	405	276	667	791	918	
BOROUGH OF RICHMOND.....	77,675	1,515	19.5	296	139	73	247	300	462	
<i>Cities between 100,000 and 400,000</i>	819,436	12,780	15.5	2,322	926	828	2,072	2,755	3,798	
Buffalo.....	396,535	6,111	15.4	1,252	550	478	981	1,224	1,616	
Recheater.....	196,793	2,913	14.8	440	223	168	492	651	953	
Syracuse.....	125,378	1,947	15.5	402	103	100	510	410	616	
Albany.....	100,730	1,759	17.5	227	87	82	284	467	613	
<i>Cities between 50,000 and 100,000</i>	291,937	4,611	15.8	1,006	392	27	779	93	1,273	
Troy.....	77,242	1,487	19.3	212	81	67	248	357	522	
Schenectady.....	73,037	846	11.6	214	80	53	156	162	187	
Yonkers.....	72,208	1,125	15.6	301	148	70	198	189	218	
Utica.....	69,458	1,153	16.6	279	83	57	183	205	346	
<i>Cities between 20,000 and 50,000</i>	408,897	6,452	15.8	1,188	432	354	976	1,327	2,173	
Binghamton.....	45,855	712	15.5	27	57	52	97	148	221	
Elmira.....	35,765	546	15.3	53	26	28	71	141	227	
Auburn.....	34,272	499	14.6	81	17	26	74	167	194	
Niagara Falls.....	32,012	465	14.5	127	35	26	165	91	81	
Jamesstown.....	28,495	343	12.0	46	19	23	56	55	144	
Watertown.....	28,140	423	15.0	79	19	26	62	86	151	
Mt. Vernon.....	27,891	392	14.1	80	28	20	49	81	124	
Newburgh.....	27,418	482	17.2	68	29	27	78	102	178	
Kingston.....	26,110	519	19.9	70	24	40	84	116	185	
Poughkeepsie.....	26,039	501	19.2	78	30	18	64	106	205	
Amsterdam.....	25,267	423	16.7	109	23	17	86	75	118	
New Rochelle.....	24,920	323	13.0	74	35	18	44	59	93	
Cohoes.....	24,185	488	20.2	123	64	27	74	88	111	
Oswego.....	22,528	336	14.9	73	16	6	28	72	131	
<i>Cities between 10,000 and 20,000</i>	356,870	5,299	14.8	956	288	296	785	1,040	1,933	
Rome.....	18,917	382	20.2	55	22	24	44	61	175	
Gloversville.....	18,761	300	16.0	36	13	12	44	71	124	
Lockport.....	18,105	276	15.2	34	9	27	39	57	109	
Dunkirk.....	18,061	202	11.2	49	9	13	33	42	56	
Middletown.....	16,610	256	15.4	32	13	11	48	46	106	
Glens Falls.....	16,279	226	13.9	37	9	16	42	44	78	
Ithaca.....	15,584	211	13.5	21	11	13	31	48	87	
Peekskill, village.....	15,473	247	16.0	58	22	9	28	42	77	
Corning.....	15,339	217	14.1	41	9	16	34	40	71	
Ogdensburg.....	14,921	245	16.4	55	13	17	36	29	85	
Watervliet.....	14,609	230	15.7	43	18	10	40	48	70	
Hornell.....	14,126	185	13.1	16	3	9	31	49	77	
Olean.....	18,000	211	11.7	39	13	15	36	30	78	
Geneva.....	13,543	175	12.9	25	3	5	31	38	72	
Saratoga Springs, village.....	13,471	249	18.5	23	5	12	48	61	100	
Rensselaer.....	13,368	174	13.0	28	8	13	20	39	65	
Cortland.....	12,538	162	12.9	29	2	5	22	34	70	
Fulton.....	11,750	167	14.2	22	11	10	19	22	83	
Little Falls.....	11,563	183	15.8	40	8	12	30	39	50	
Plattsburg.....	11,450	199	17.4	48	19	7	32	35	57	
Lockawanna.....	11,370	150	13.2	97	25	2	12	9	5	
Hudson.....	11,032	172	15.6	34	8	8	23	38	61	
North Tonawanda.....	10,987	162	14.7	55	21	15	11	28	32	
Batavia, village.....	10,961	179	16.3	30	8	11	29	32	69	
Oneida.....	10,099	139	13.8	9	6	4	12	32	76	

Total Mortality in Cities for the Year 1909 — (Continued)

	EPIDEMIC DISEASES									
	Typhoid fever	Malarial diseases	Smallpox	Measles	Scarlatina	Whooping cough	Diphtheria and croup	Influenza	Erysipelas	Cerebro-spinal meningitis
<i>City of New York</i>	584	39	2	896	787	401	1,715	334	311	323
BOROUGH OF MANHATTAN	262	7	2	388	359	220	962	166	224	182
BOROUGH OF THE BRONX	63	3	...	58	49	34	103	16	18	32
BOROUGH OF BROOKLYN	191	24	...	508	327	118	557	138	64	96
BOROUGH OF QUEENS	37	4	...	3	42	23	73	10	3	8
BOROUGH OF RICHMOND	11	1	...	12	10	6	20	4	2	5
<i>Cities between 100,000 and 400,000</i>	146	...	...	117	207	80	167	41	24	14
Buffalo.....	96	...	...	77	168	14	102	12	12	4
Rochester.....	17	...	...	35	20	22	20	7	4	9
Syracuse.....	14	...	...	...	15	35	26	13	5	1
Albany.....	19	...	...	7	4	9	19	9	3	...
<i>Cities between 50,000 and 100,000</i>	41	4	...	10	58	19	39	23	17	20
Troy.....	17	...	...	...	6	10	6	12	4	8
Schenectady.....	8	...	...	1	20	4	8	7	3	1
Yonkers.....	5	3	...	...	18	...	18	1	6	3
Utica.....	11	1	...	8	8	5	7	8	4	8
<i>Cities between 20,000 and 50,000</i>	128	4	1	28	23	46	89	39	17	20
Binghamton.....	6	1	...	4	2	9	18	3	2	3
Elmira.....	12	...	...	4	6	2	2	8	4	...
Auburn.....	6	...	...	...	...	2	3	1	1	1
Niagara Falls.....	24	...	...	2	5	...	9	3	1	1
Jamestown.....	5	1	...	...	2	1	13	4	1	...
Watertown.....	11	1	...	...	1	5	2	5	...	...
Mt. Vernon.....	2	...	...	3	...	5	5	...	1	1
Newburgh.....	13	1	...	...	2	2	2	3	...	1
Kingston.....	8	...	...	1	...	...	9	5	1	5
Poughkeepsie.....	6	...	...	2	2	7	5	2	...	1
Amsterdam.....	3	...	...	...	2	...	9	...	2	1
New Rochelle.....	6	...	...	1	1	2	7	1	3	2
Cohoes.....	20	...	1	11	...	6	5	1	...	4
Oswego.....	6	...	...	...	...	5	...	3	1	...
<i>Cities between 10,000 and 20,000</i>	77	2	...	9	25	40	51	65	10	17
Rome.....	3	...	...	1	2	11	3	7	2	2
Gloversville.....	2	...	...	...	1	1	10	1	...	2
Lockport.....	9	...	...	...	4	1	3	6	2	...
Dunkirk.....	2	...	...	...	1	...	3	...	...	...
Middletown.....	3	...	...	...	2	1	3	4	...	2
Glens Falls.....	1	1	...	...	...	...	1	1	...	1
Ithaca.....	3	...	...	...	...	2	6	3	...	...
Peekskill, village.....	2	...	...	...	...	1	...	1	...	...
Corning.....	19	...	...	2	1	...	...	1	...	...
Ogdensburg.....	4	...	...	3	...	5	3	2	3	2
Watervliet.....	1	1	...	...	...	5	...	6	...	...
Hornell.....	3	...	...	1	...	...	...	2	...	1
Olean.....	2	...	...	...	3	2	1	3	1	1
Geneva.....	2	...	...	...	...	1	1	4	...	1
Saratoga Springs, village.....	4	...	...	...	...	1	1	3	...	2
Rensselaer.....	3	...	...	...	...	...	...	3	...	...
Cortland.....	3	...	...	...	...	...	...	...	1	...
Fulton.....	...	...	...	...	...	4	1	4	...	...
Little Falls.....	1	...	...	...	1	...	3	2	...	2
Plattsburg.....	3	...	...	...	...	3	1	1	...	1
Laekawanna.....	1	...	...	...	3	...	1	1	...	...
Hudson.....	1	...	...	...	...	3	...	...	...	1
North Tonawanda.....	6	...	...	1	3	1	7	1	...	...
Batavia, village.....	3	...	...	...	2	2	2	4	...	...
Oneida.....	...	...	...	1	...	...	1	1	1	...

Total Mortality in Cities for the Year 1909 — (Continued)

	Pulmonary tuberculosis	Cancer	Other general diseases	Diseases of the nervous system	Diseases of the circulatory system	Pneumonia	Other diseases of the respiratory system	Diarrhea and enteritis (under 2 years)	Other diseases of the digestive system	Bright's disease
<i>City of New York</i>	8,645	3,487	5,503	2,956	10,137	5,249	7,502	5,138	3,877	4,653
BOROUGH OF MANHATTAN.....	4,206	1,827	3,209	1,511	4,830	2,566	4,204	2,547	1,970	2,342
BOROUGH OF THE BRONX.....	1,623	295	386	281	858	382	407	304	289	346
BOROUGH OF BROOKLYN.....	2,348	1,110	1,500	942	3,657	1,921	2,429	1,825	1,324	1,758
BOROUGH OF QUEENS.....	309	170	280	135	597	279	363	351	213	258
BOROUGH OF RICHMOND.....	159	85	128	67	195	101	99	111	81	148
<i>Cities between 100,000 and 400,000</i>	1,120	676	1,128	1,342	1,737	604	959	609	978	743
Buffalo.....	523	271	633	664	799	228	608	240	490	236
Rochester.....	282	172	190	311	377	178	196	179	222	229
Syracuse.....	145	114	198	187	274	118	76	136	136	133
Albany.....	170	118	107	180	287	80	79	54	140	145
<i>Cities between 50,000 and 100,000</i>	489	221	406	440	607	336	293	355	359	286
Troy.....	185	94	113	179	202	98	63	48	115	101
Schenectady.....	86	31	83	74	76	60	54	75	69	62
Yonkers.....	107	43	101	76	125	98	109	141	80	45
Utica.....	111	53	109	111	104	80	67	91	95	78
<i>Cities between 20,000 and 50,000</i>	498	319	578	749	710	450	353	363	494	464
Binghamton.....	36	30	67	82	79	58	30	25	53	58
Elmira.....	34	25	57	58	79	30	35	14	36	67
Auburn.....	34	31	39	69	66	29	25	42	35	34
Niagara Falls.....	34	10	51	39	41	40	25	41	22	20
Jamestown.....	18	25	37	50	33	28	15	10	28	23
Watertown.....	30	21	46	53	58	21	24	13	49	12
Mt. Vernon.....	29	21	33	36	32	22	29	35	33	40
Newburgh.....	45	17	37	63	52	41	25	13	39	46
Kingston.....	62	22	39	76	69	42	20	12	36	26
Poughkeepsie.....	34	38	39	61	72	36	23	20	41	34
Amsterdam.....	38	25	33	47	40	32	17	50	26	25
New Rochelle.....	25	13	25	24	23	23	33	24	27	31
Cohoes.....	59	18	42	47	33	26	43	47	34	25
Oswego.....	22	23	33	44	33	22	9	17	35	23
<i>Cities between 10,000 and 20,000</i>	577	282	467	624	652	379	263	249	593	560
Rome.....	21	19	28	48	63	22	10	16	29	29
Gloversville.....	22	21	23	39	36	18	17	2	26	28
Lockport.....	23	15	21	36	23	20	17	6	16	10
Dunkirk.....	10	12	27	17	28	16	7	7	18	11
Middletown.....	20	12	20	32	29	13	7	6	25	27
Glens Falls.....	24	17	22	29	24	11	9	6	22	12
Ithaca.....	13	14	25	22	27	10	6	6	13	28
Peekskill, village.....	17	12	32	35	13	20	14	23	15	29
Corning.....	12	9	13	18	30	19	10	7	18	11
Ogdensburg.....	17	18	17	26	34	18	18	9	15	10
Watervliet.....	29	7	17	29	25	23	21	14	15	8
Hornell.....	12	9	15	26	34	10	7	1	12	10
Olean.....	9	12	20	32	16	16	8	9	23	11
Geneva.....	15	7	12	18	25	19	8	4	10	9
Saratoga Springs, village.....	10	17	12	36	44	10	15	2	21	26
Rensselaer.....	12	12	9	23	25	13	9	7	18	11
Cortland.....	6	8	20	17	20	12	5	1	13	25
Fulton.....	8	2	13	23	23	14	5	9	16	13
Little Falls.....	18	9	18	17	17	14	7	14	10	6
Plattsburg.....	16	12	21	27	18	12	14	17	9	5
Lackawanna.....	22	1	17	4	7	12	6	48	5	1
Hudson.....	14	10	18	18	19	11	5	15	14	18
North Tonawanda.....	8	10	7	19	16	18	11	12	10	4
Batavia, village.....	8	7	29	10	12	13	12	6	10	14
Oneida.....	5	10	11	23	24	15	5	2	10	4

Total Mortality in Cities for the Year 1909 — (Continued)

	Other diseases of the genito-urinary system	The puerperal state	Diseases of the skin	Diseases of the organs of locomotion	Malformations	Early infancy (under three months)	External causes	Ill-defined diseases	BIRTHS		
									Total births	Annual birth rate per 1000 population	Still births
<i>City of New York</i>	1,252	715	237	203	643	2,252	4,799	1,180	122,367	27.5	6,868
BOROUGH OF MANHATTAN...	581	363	146	129	269	1,322	2,555	612	62,990	27.3	3,742
BOROUGH OF THE BRONX...	93	64	13	14	37	199	373	86	9,574	29.1	455
BOROUGH OF BROOKLYN...	496	230	62	57	317	593	1,460	302	41,997	27.6	2,202
BOROUGH OF QUEENS...	61	43	8	1	23	102	304	112	6,317	27.0	358
BOROUGH OF RICHMOND...	31	15	8	2	3	36	107	68	1,992	25.6	81
<i>Cities between 100,000 and 400,000</i>	329	173	44	20	103	226	797	341	17,218	21.0	855
Buffalo.....	135	115	2	6	46	67	378	195	9,027	22.8	423
Rochester.....	66	37	19	5	27	41	186	64	4,292	21.8	216
Syracuse.....	53	21	13	5	21	47	129	32	2,661	21.2	124
Albany.....	75	6	10	4	9	71	104	50	1,238	12.3	92
<i>Cities between 50,000 and 100,000</i>	115	46	15	9	43	97	280	84	6,527	22.3	302
Troy.....	33	11	5	4	9	47	71	46	985	12.8	47
Schenectady.....	14	9	5	2	15	19	54	6	1,774	24.3	62
Yonkers.....	29	12	1	2	5	1	77	18	1,961	27.2	89
Utica.....	39	14	4	1	14	30	78	14	1,807	26.0	104
<i>Cities between 20,000 and 50,000</i>	170	56	36	11	55	149	456	148	8,609	21.5	344
Binghamton.....	29	8	5	2	4	22	59	17	933	20.3	40
Elmira.....	18	3	1	...	4	5	38	4	537	15.0	20
Auburn.....	10	7	5	...	7	7	27	18	615	17.9	36
Niagara Falls.....	7	4	1	2	5	12	53	13	664	20.7	36
Jamestown.....	6	2	1	1	4	5	21	9	575	20.0	22
Watertown.....	9	6	2	...	4	8	32	10	507	18.0	24
Mt. Vernon.....	8	3	1	1	4	8	26	13	798	22.7	30
Newburgh.....	17	7	3	...	5	11	29	9	469	17.1	20
Kingston.....	14	2	4	...	2	14	38	12	502	19.2	15
Poughkeepsie.....	8	1	3	2	3	16	34	11	542	20.8	12
Amsterdam.....	10	7	3	...	2	11	28	12	756	29.9	10
New Rochelle.....	10	2	1	...	3	10	23	5	727	29.2	31
Cohoes.....	9	2	4	2	5	14	27	3	503	20.8	25
Oswego.....	15	2	2	1	3	6	21	10	481	21.4	13
<i>Cities between 10,000 and 20,000</i>	156	56	26	7	43	143	426	148	6,797	19.5	262
Rome.....	8	4	5	1	1	6	29	12	480	25.4	14
Gloversville.....	12	2	2	...	3	4	25	3	388	20.7	19
Lockport.....	5	3	...	...	3	9	28	16	373	20.6	21
Dunkirk.....	3	4	...	1	2	8	21	4	535	29.6	18
Middletown.....	7	3	1	...	2	8	24	4	279	16.8	13
Glens Falls.....	6	1	...	...	2	12	18	7	242	14.9	10
Ithaca.....	5	2	1	...	3	6	11	5	289	18.5	7
Peekskill, village.....	1	5	1	...	4	6	13	3	303	19.6	16
Corning.....	5	5	1	1	2	7	17	9	253	16.5	13
Ogdensburg.....	6	3	...	1	4	7	12	10	355	23.8	9
Watervliet.....	10	...	2	...	...	5	9	2	195	13.3	9
Hornell.....	9	3	2	...	3	1	17	8	291	20.6	5
Olean.....	4	4	...	...	...	3	21	9	307	17.1	14
Geneva.....	4	1	...	1	4	8	16	7	254	18.8	8
Saratoga Springs, village.....	9	6	1	...	1	3	17	2	246	18.3	16
Rensselaer.....	2	...	...	...	1	6	17	2	181	13.5	6
Cortland.....	4	1	...	...	...	7	17	2	220	17.5	3
Fulton.....	4	2	2	...	...	4	10	10	219	18.6	7
Little Falls.....	6	1	1	...	...	6	23	7	323	27.8	6
Plattsburg.....	5	1	1	...	...	13	12	7	223	19.5	17
Lackawanna.....	1	...	...	...	1	5	14	1	171	15.0	...
Hudson.....	4	2	...	...	3	...	11	5	198	17.9	9
North Tonnawanda.....	3	1	...	...	4	...	16	2	330	30.0	14
Batavia, village.....	12	1	2	1	...	6	17	6	227	20.7	14
Oneida.....	3	2	3	1	...	1	11	5	138	13.7	4

Total Mortality in Cities for the Year 1909 — (Continued)

	Population, U. S. census estimate 1909	Total deaths	Annual death rate per 1000 population	AGES					
				Deaths under 1 year	Deaths 1 to 4 years	Deaths 5 to 19 years	Deaths 20 to 39 years	Deaths 40 to 59 years	Deaths at 60 years and over
<i>Cities under 10,000</i>	35,525	595	16.7	69	22	37	97	105	205
Port Jervis	9,943	183	18.4	18	8	11	36	28	82
Johnstown	9,473	155	16.4	15	6	9	15	33	77
Oneonta	8,794	152	17.3	20	5	9	30	27	61
Tonawanda	7,315	105	14.3	16	3	8	16	17	45
TOTAL URBAN MORTALITY	6,363,628	103,792	16.3	21,485	10,649	6,012	18,183	22,153	25,224
RURAL MORTALITY	2,339,015	36,469	15.6	4,592	1,552	1,650	5,336	6,226	18,004

Total Mortality in Cities for the Year 1909 — (Continued)

	EPIDEMIC DISEASES									
	Typhoid fever	Malarial diseases	Smallpox	Measles	Scarlatina	Whooping cough	Diphtheria and croup	Influenza	Erysipelas	Cerebro-spinal meningitis
<i>Cities under 10,000.....</i>	11			1	1		6	10		1
Port Jervis.....	2						2	5		
Johnstown.....							2	2		1
Oneonta.....	7			1	1		2			
Tonawanda.....	2						2	3		
TOTAL URBAN MORTALITY.....	967	49	3	1,161	1,096	588	2,067	517	379	395
RURAL MORTALITY.....	348	29	1	111	110	197	246	606	93	80

Total Mortality in Cities for the Year 1909 — (Continued)

	Pulmonary tuberculosis	Cancer	Other general diseases	Diseases of the nervous system	Diseases of the circulatory system	Pneumonia	Other diseases of the respiratory system	Diarrhea and enteritis (under 2 years)	Other diseases of the digestive system	Bright's disease
<i>Cities under 10,000</i>	38	39	53	76	89	44	28	12	52	37
Port Jervis.....	8	8	14	15	24	25	9	3	21	15
Johnstown.....	10	18	20	21	26	9	8	1	4	11
Oneonta.....	11	7	15	20	19	5	8	5	16	9
Tonawanda.....	9	6	4	20	20	5	3	3	11	2
TOTAL URBAN MORTALITY	11,167	5,023	8,135	6,187	13,812	7,062	9,388	6,726	6,153	6,743
RURAL MORTALITY	2,829	2,037	2,778	5,004	4,972	2,361	2,018	1,147	2,638	2,650

Total Mortality in Cities for the Year 1909 — (Concluded)

	Other diseases of the genito-urinary system	The puerperal state	Diseases of the skin	Diseases of the organs of locomotion	Malformations	Early infancy (under three months)	External causes	Ill-defined diseases	BIRTHS		
									Total births	Annual birth rate per 1000 population	Still births
<i>Cities under 10,000</i>	12	4	7	.....	7	10	36	21	669	18.8	25
Port Jervis.....	2	1	4	.....	2	4	16	5	172	17.3	7
Johnstown.....	4	1	3	.....	2	2	3	7	156	16.5	4
Oneonta.....	4	2	.....	.....	2	3	9	6	157	17.5	4
Tonawanda.....	2	.....	.....	.....	1	1	8	3	184	25.2	10
TOTAL URBAN MORTALITY	2,016	1,056	365	250	899	2,877	6,794	1,920	162,187	25.5	8,656
RURAL MORTALITY	787	277	284	40	301	662	2,438	1,416	40,469	17.3	1,383

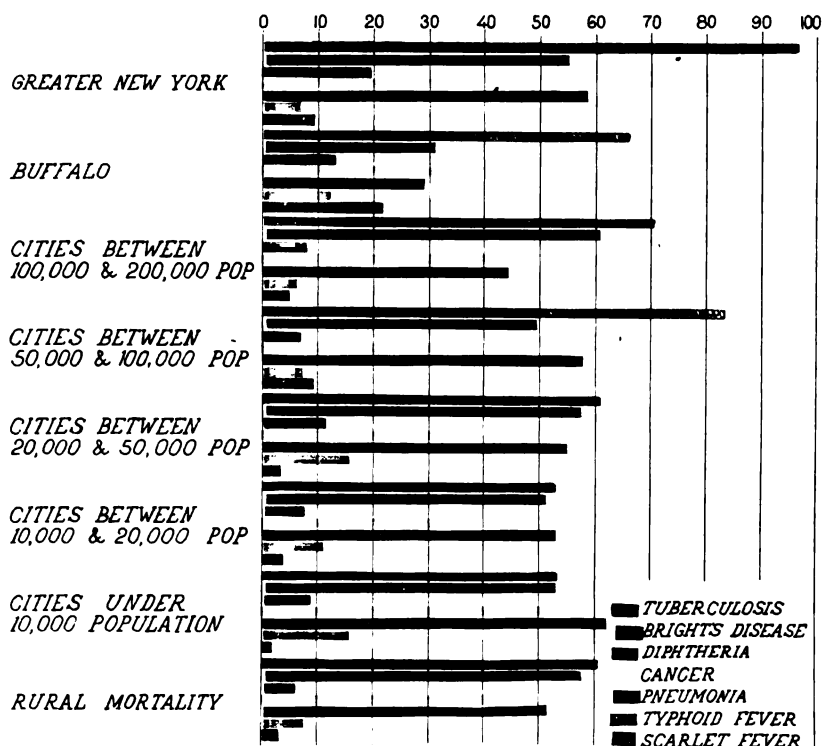
Summary of Mortality in the Sanitary Districts for the Year
1909

DISTRICTS	Total deaths	Annual death rate per 1,000 population	AGES					
			Deaths under 1 year	Deaths 1 to 4 years	Deaths 5 to 19 years	Deaths 20 to 39 years	Deaths 40 to 59 years	Deaths at 60 years and over
Maritime.....	80,981	16.6	17,150	9,112	4,623	14,529	17,439	18,108
Hudson Valley.....	12,322	16.9	1,752	649	590	1,772	2,506	5,019
Adirondack.....	6,256	15.0	1,006	309	305	812	1,048	2,766
Mohawk Valley.....	7,116	15.2	1,207	350	340	955	1,265	2,963
Southern Tier.....	6,977	15.5	794	271	325	782	1,212	3,585
East Central.....	6,619	15.5	881	253	285	855	1,189	3,145
West Central.....	4,856	15.2	504	152	211	598	855	2,522
Lake Ontario and Western.....	15,134	15.0	2,783	1,105	963	2,210	2,865	5,190
Total.....	140,261	16.1	26,077	12,201	7,662	22,519	28,379	43,298
City deaths.....	103,792	16.3	21,485	10,649	6,012	18,183	22,153	25,294
Rural deaths.....	36,469	15.6	4,592	1,552	1,650	3,336	6,226	18,004

Summary of Mortality in the Sanitary Districts for the Year
1909 — (Continued)

DISTRICTS	EPIDEMIC DISEASES									
	Typhoid fever	Malarial diseases	Small-pox	Measles	Scarlatina	Whooping cough	Diphtheria and croup	Influenza	Erysipelas	Cerebro-spinal meningitis
Maritime.....	613	46	3	1,033	825	439	1,807	383	330	347
Hudson Valley.....	146	13	1	50	36	85	105	126	17	39
Adirondack.....	80	3	.....	29	8	54	32	100	18	15
Mohawk Valley.....	63	5	.....	12	47	33	53	77	21	25
Southern Tier.....	101	6	.....	20	22	27	71	120	25	18
East Central.....	68	.....	.....	4	29	58	43	106	17	9
West Central.....	44	3	.....	5	11	20	25	91	16	2
Lake Ontario and Western.....	200	2	.....	119	227	67	177	119	28	30
Total.....	1,315	78	4	1,272	1,205	783	2,313	1,122	472	485
City deaths.....	967	40	3	1,161	1,095	586	2,067	517	379	395
Rural deaths.....	348	29	1	111	110	197	246	605	93	90

DEATHS PER 100,000 POPULATION CITY & RURAL FOR 1909



*Summary of Mortality in the Sanitary Districts for the Year
1909 — (Continued)*

DISTRICT	Pul- monary tuber- culosis	Cancer	Other general diseases	Diseases of the nervous system	Diseases of the circula- tory system	Pneu- monia	Other diseases of the respira- tory system	Diarrhea and enteritis (under 2 years)	Other diseases of the digestive system	Bright's disease
Maritime.....	9,252	3,841	6,044	3,771	10,871	5,667	8,020	5,598	4,369	5,410
Hudson Valley.....	118	657	869	1,541	1,622	880	617	427	906	954
Adirondack.....	556	341	507	801	785	446	348	245	477	362
Mohawk Valley.....	585	397	601	877	883	469	373	357	498	554
Southern Tier.....	362	412	582	919	1,023	415	377	152	587	496
East Central.....	512	383	581	825	969	460	288	234	474	468
West Central.....	335	296	410	695	679	274	256	128	374	347
Lake Ontario and Western	1,213	733	1,319	1,762	1,952	832	1,127	732	1,106	802
Total.....	13,996	7,060	10,913	11,191	18,784	9,423	11,406	7,873	8,791	9,393
City deaths.....	11,167	5,023	8,135	6,187	13,812	7,062	9,388	6,726	6,153	6,743
Rural deaths.....	2,829	2,037	2,778	5,004	4,972	2,361	2,018	1,147	2,638	2,650

*Summary of Mortality in the Sanitary Districts for the Year
1909 — (Concluded)*

DISTRICTS	Other diseases of the genito- urinary system	The puer- peral state	Diseases of the skin	Diseases of the organs of loco- motion	Malfor- mations	Early infancy (under 3 months)	External causes	Ill- defined diseases
Maritime.....	1,392	770	271	211	702	2,355	5,295	1,316
Hudson Valley.....	310	85	71	15	94	313	863	319
Adirondack.....	115	59	49	5	66	166	336	253
Mohawk Valley.....	176	69	52	11	75	150	433	220
Southern Tier.....	201	63	59	13	48	115	467	276
East Central.....	158	55	44	12	58	127	407	230
West Central.....	120	34	35	4	39	67	320	226
Lake Ontario and Western.....	331	198	68	19	118	246	1,111	496
Total.....	2,803	1,333	649	290	1,200	3,539	9,232	3,336
City deaths.....	2,016	1,056	365	250	899	2,877	6,794	1,920
Rural deaths.....	787	277	284	40	301	662	2,438	1,416

Record of each reporting local board of health, showing total deaths from all causes and from the principal zymotic diseases for 1909, by counties

[Cities are printed in SMALL CAPS, villages in *italics* and towns in Roman type.]

NAME OF PLACE	Population, State census, 1905	All deaths	Cerebro-spinal meningitis	Typhoid fever	Malarial diseases	Scarlet fever	Measles	Whooping cough	Diphtheria	Diarrhea	Consumption	Influenza	Cancer
ALBANY COUNTY	171,497	8,248											
ALBANY	98,374	1,759		42	1	4	19	22	31	128	283	21	170
COHOSUS	24,183	488	4	20		4	7	9	19	54	170	9	118
Berne	1,915	27								1	2		1
Bethlehem	4,451	68		1						2	6	1	3
Coeymans	4,264	53	1	1					1	1	2	1	4
Colonie	3,540	119	1						4	5	6	2	5
Guilderland	1,174	48							1	2			2
Knox	3,015	23	1							1	1		2
New Scotland	1,682	36							1				3
Rensselaerville	7,845	23									1		2
Westerlo	1,558	22									1	1	1
WATERVLIET	14,800	220		1	1		1	5		14	29	6	7
Green Island	4,878	66						2		1	4		4
ALLEGANY COUNTY	43,267	604	1	13	1	2	2	3	1	14	23	13	33
Alfred	1,784	25				1				1	1	1	2
Allen	631	5											
Alma	1,064	5											
Almond	1,429	15								1			
Amity	2,337	36					2			1			3
Andover	1,979	35			1						4	2	2
Angelica	1,676	41								1	2		1
Belfast	1,640	24								2	2	1	2
Birdsall	653	7											
Bolivar	2,306	22	1	1							1		3
Burns	1,461	20								1	1		
Caneades	1,387	20								1		2	2
Centerville	1,029	11								2	1		
Clarksville	838	10											
Cuba	2,340	40		1							2		1
Friendship	2,237	36				1				1	2	1	
Genesee	1,146	11						1					1
Granger	761	4								2			
Grove	766	16											1
Hume	1,817	30		2							2	1	2
Independence	1,222	10										1	
New Hudson	879	9									1		2
Rushford	1,432	18										1	
Scio	1,354	23		2							1		1
Ward	521	6											
Wellsville	5,721	17		2				1				1	2
Wellsville	4,673	75		5				1	1		2	1	5
West Almond	548	6											
Willing	1,120	17								1	1	1	
Wirt	1,153	10											1
BROOME COUNTY	72,222	1,197	3	11	1	4	4	11	20	33	67	17	57
BINGHAMTON	42,036	712	3	6	1	2	4	9	18	25	36	3	30
Barker	984	17								1			2
Binghamton	703	12		1							3		1
Chenango	1,314	23		2						1	1		2
Colesville	2,457	45				1					1	3	2
Conklin	935	10		1						1	1		
Dickinson	703	53							1		5	1	4
Fenton	1,145	16										1	
Kirkwood	887	16		1									2
Leicester	4,403	48								2	6	1	3
Lisle	1,551	18									1		2
Maine	1,411	23									3	3	
Nanticoke	621	7											
Sanford	3,424	51				1				1	4	1	4
Triangle	1,633	24									1	1	3
Union	8,146	64						2			4	3	1
Vestal	1,681	24									1		
Windsor	2,634	34							1	2			1

Record of each reporting local board of health, showing total deaths, etc.— (Continued)

[Cities are printed in SMALL CAPS, villages in *italics* and towns in Roman type.]

NAME OF PLACE	Population, State census, 1905	All deaths	Cerebro-spinal meningitis	Typhoid fever	Malarial diseases	Scarlet fever	Measles	Whooping cough	Diphtheria	Diarrhea	Consumption	Infantile	Cancer
CATTARAUGUS CO.	66,196	870	7	18	1	4	8	4	5	21	39	15	59
OLEAN.	10,163	211	1	2		3		2	1	9	9	3	12
Allegheny.	3,554	39	2								1		3
Ashford.	1,567	19										1	5
Carrollton.	1,600	17								1	1	1	
Cold Spring.	713	8									1		1
Conewango.	1,162	9									1		1
Dayton.	1,754	26		1							1		3
East Otto.	1,111	15								1	1		1
Elko.	324	3										1	
Ellicottville.	2,115	29		1		1				1	2	1	
Farmersville.	1,014	10					1		1		1	1	1
Franklinville.	2,510	47						2			1		2
Freedom.	1,229	12										1	3
Great Valley.	2,167	22					1			1			
Hinsdale.	1,152	16		1							2		
Humphrey.	680	5								1	1		
Iechua.	811	6											
Leon.	845	4											
Little Valley.	1,722	25		2							1	2	5
Lyndon.	647	10										1	1
Machias.	1,494	46									1	1	4
Mansfield.	940	7		1							1		
Napoli.	791	9		1									
New Albion.	2,047	27		1							1		2
Olean.	5,141	13	3								3		
Otto.	927	13									1		
Perryburg.	1,049	16									1		1
Perna.	1,858	21									2		2
Portville.	2,398	26								2	1	1	4
Randolph.	2,346	36								2	1		2
Red House.	564	7								1	1		
<i>Salamanna.</i>	5,455	73	1		1				3	2	2		5
<i>Salamanna.</i>	973	5											
South Valley.	562	7		1									
Yorkshire.	1,730	31		1							1	1	1
CAYUGA COUNTY.	65,309	1,032	1	9		1		5	3	49	63	14	78
AUBURN.	31,422	499	1	6				2	3	42	34	1	31
Anselius.	1,548	22								1			2
Brutus.	2,488	27								1		1	2
Cato.	1,474	20									3	1	2
Conquest.	1,187	15								1		1	1
Fleming.	1,006	20						2					1
Genoa.	1,866	22											1
Ira.	1,587	22		1							2		1
Ledyard.	1,996	21								1	3		2
Locke.	914	16									2		1
Menta.	1,885	34				1					6		5
Montesuma.	914	18								1		1	2
Moravia.	2,723	41										2	3
Niles.	1,159	21									1	1	2
Owasco.	1,302	30		1						1		1	4
Scipio.	1,512	21									5		
Sempronius.	594	8											
Sennett.	1,859	32						1			4	1	
Springport.	1,336	36									1		3
Sterling.	2,504	39		1								1	1
Summer Hill.	609	13										1	3
Throop.	984	9											1
Venice.	1,309	20										1	3
Victory.	1,316	26									1	1	1
CHAUTAUQUA CO.	96,830	1,381	3	14	1	4		1	35	36	61	29	37
DUNKIRK.	15,250	202		2		1			3	7	10		12
JAMESTOWN.	26,160	343		5	1	2		1	13	10	18	4	25
Arkwright.	863	7										1	1

Record of each reporting local board of health, showing total deaths, etc.— (Continued)

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CHAUTAUQUA CO.—													
<i>(Continued)</i>													
Busti.....	2,086	28								1		4	2
Carroll.....	1,638	31								1		1	1
Charlotte.....	1,193	15									1	1	1
Chautauqua.....	3,505	91	1			1					4	1	6
Cherry Creek.....	1,441	22		1					1			3	4
Clymer.....	1,180	11								1	1		2
Dunkirk.....	438	1											
Ellery.....	1,638	31								1	1	1	2
Ellicott.....	3,904	46								1	3	3	3
Ellington.....	1,264	10	1								1		1
<i>Fredonia</i>	5,148	53	1	1					11	4	2	1	5
French Creek.....	951	15									1	1	
Gerry.....	1,146	14									1	1	2
Hanover.....	5,149	63		1					2	2	5		3
Harmony.....	2,782	38							1	1	4		1
Kiantone.....	624	8								1			
Mina.....	1,012	10											1
Poland.....	1,497	23		1						1			2
Pomfret.....	7,808	33							1	1	2	1	
Portland.....	3,054	37		3									3
Ripley.....	2,257	36								1	2		2
Sheridan.....	1,861	28									3		
Sherman.....	1,506	33								2			2
Stockton.....	1,821	28										2	1
Villanova.....	1,054	21									1		1
Westfield.....	1,531	16										1	1
<i>Westfield</i>	2,823	57							3			2	4
CHEMUNG COUNTY.													
ELMIRA.....	51,600	852		18		6	4	4	8	17	64	12	42
Ashland.....	34,687	546		12		6	4	2	2	11	34	8	25
Baldwin.....	840	11							1				2
Big Flats.....	506	10		2									
Catlin.....	1,571	31		2							1		1
Chemung.....	912	19						1			2		2
Elmira.....	1,328	20									3		
Erin.....	1,377	49		2							8	2	2
Horseheads.....	898	13									1	1	1
Horseheads.....	4,826	89						1			11		5
Southport.....	2,073	23								2	2		
Van Etten.....	1,086	23								1	1		4
Veteran.....	1,475	18									1	1	
CHENANGO COUNTY													
Afton.....	36,783	642	1	7		4		2	5	11	27	12	34
Bainbridge.....	1,851	39									1	1	1
Columbus.....	1,968	25		1							1		1
Coventry.....	863	12	1			1					1		1
German.....	889	11						1			1		2
Greene.....	430	6											
Guilford.....	3,164	60									1	5	1
Lincolnton.....	2,261	26											1
McDonough.....	607	0											
New Berlin.....	816	16										1	2
North Norwich.....	2,425	41									3		1
Norwich.....	742	7									1	1	
Norwich.....	1,332	29		2						2			2
Otselic.....	7,115	137				3			3	6	9	2	12
Oxford.....	1,111	14									1	1	1
Pharsalia.....	3,258	82						1			2		4
Pitcher.....	690	8									1		1
Plymouth.....	740	16									2		
Preston.....	995	15								1	1		1
Sherburne.....	626	15									1	1	1
Smithville.....	2,695	42		1							1		
Smyna.....	994	12		2									
Smyna.....	1,193	20								2		1	2

Record of each reporting local board of health, showing total deaths, etc.— (Continued)

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CLINTON COUNTY...	47,288	631	3	4		1	3	8	3	40	89	19	31
Altona	2,500	33							1	2	2	5	
Ausable	2,399	20								1	1		1
Beekmantown	1,889	30		1						1	3		
Black Brook	2,129	19				1				3	2	1	1
Champlain	4,841	51	1					2		5	7		3
Chazy	2,335	36								4	4		2
Clinton	1,590	21								1	3	1	
Dannemora	2,717	21									1		2
Ellenburg	3,201	11									1	1	2
Moers	3,382	67						2	1	2	8	3	1
Peru	2,354	30								2	2	1	2
Plattsburg	2,475	31					2				2		1
PLATTSBURG	10,184	199	1	3				3	1	17	16	1	12
Saranac	3,156	39									3	2	5
Schuyler Falls	1,642	24	1				1	1		3	1		1
COLUMBIA COUNTY	48,868	648	1	6		6		6	1	27	54	4	34
Humeon	10,290	172	1	1				3		15	14		10
Ancram	1,212	17				1					1		3
Austerlitz	926	16									1		1
Canaan	1,266	19									1		1
Chatham	3,493	64		3						1	7	4	1
Claverack	4,459	56								2	6		3
Clermont	768	10		1		2							
Copalco	1,846	20				1		1		1			2
Gallatin	751	13				1					2		1
Germantown	1,684	19									5		
Ghent	2,681	51									5		
Greenport	1,151	14				1		2					3
Hilldale	1,423	12								2			
Kinderhook	3,218	57		1					1	2	3		2
Livingston	1,606	18									1		2
New Lebanon	1,498	17											1
Stockport	2,569	32								1	4		2
Stuyvesant	1,908	20								2	4		2
Taghkanic	760	11								1			
CORTLAND COUNTY	29,603	413		6				1		6	18	9	25
Cincinnatus	1,033	20											3
Cortlandville	3,046	58								1	6	4	
CORTLAND	11,272	162		3						1	6		8
Cuyler	945	6											
Freetown	539	7						1					1
Harford	679	7											2
Homer	1,487	12								1	1		1
Homer	2,536	47		1							2	2	2
Lapeer	442	7		1								1	1
Marathon	1,558	16									1		1
Preble	841	10											
Scott	708	13								1			2
Solon	540	8								1			2
Taylor	759	10											
Truxton	1,186	4											
Virgil	1,239	17									1	2	1
Willet	685	9									1		
DELAWARE COUNTY	46,788	645	2	6		3		6	4	13	36	13	46
Andes	1,869	31									3		2
Bovina	916	11									1		1
Colchester	3,070	34									2	1	1
Davenport	1,560	26									1		1
Delhi	2,908	53								1	3		5
Deposit	1,895	15											
Franklin	2,444	24							1				1
Hamden	1,386	20									3		1

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DELAWARE COUNTY													
<i>(Continued)</i>													
Hancock.....	5,701	63	1					1	1	3	5		5
Harpersfield.....	1,244	9									1		
Kortright.....	1,527	24		1				2			1		
Masonville.....	1,120	17								1	1		
Meredith.....	1,489	19										1	4
Middletown.....	5,519	66				1				1	2	1	3
Roxbury.....	2,206	34		1							2	3	7
Sidney.....	4,319	68		2		1		2		1	3	3	3
Stamford.....	2,049	35		1					2	1	3	1	3
Tompkins.....	2,277	26	1								3	5	5
Walton.....	4,996	70				1		1		5	3	5	
DUTCHESS COUNTY													
POUGHKEEPSIE.....	51,653	1,540	2	10		3	10	13	16	55	95	8	76
Amenia.....	25,379	501	1	6		2	2	7	5	20	34	2	38
Beekman.....	2,152	40	1						1	1	3	1	4
Clinton.....	933	13							1				
Dover.....	1,275	8									2		
East Fishkill.....	1,992	26		1				1			1		
Fishkill.....	2,088	31							1	1	1		
Fishkill Landing.....	13,183	51					3	1		6	3		1
Hyde Park.....	4,045	60					1			4	2		2
La Grange.....	2,944	41							2	1	3	6	3
Matteawan.....	1,271	21									2		
Milan.....	5,584	98		2				3	1	4	6	5	5
North East.....	926	11									1		
Pawling.....	2,063	25				1	2			1	1	1	2
Pine Plains.....	1,540	32									4		
Pleasant Valley.....	1,315	17											
Poughkeepsie.....	1,426	20								1	3		1
Red Hook.....	5,380	62		1					1	6	7	1	3
Rhinebeck.....	3,874	59					1		1	2	2	2	3
Stanford.....	3,610	52								2	4	1	2
Union Vale.....	1,641	19					1						1
Wappinger.....	976	14							1		1		1
Wappinger Falls.....	752	13							2	2	9		3
Washington.....	3,588	70						1		2	3		2
Washington.....	3,013	62											
ERIE COUNTY													
BUFFALO.....	473,700	7,502	11	110		183	78	18	115	355	627	42	329
TONAWANDA.....	376,587	6,111	4	96		168	77	14	102	240	523	12	271
Alden.....	7,904	105		2						3	9	3	6
Amherst.....	2,453	39						1		2	1	1	7
Aurora.....	4,493	47		2						1	2	1	
Boston.....	4,180	25							1		3		1
Brant.....	1,627	31					1	1		2	2	2	3
Cheektowaga.....	1,998	37		2		2			1		2	1	3
Clarence.....	6,671	101		1						12	6	1	3
Colden.....	2,817	35		1		1			2	4	4	1	1
Collins.....	1,307	20		1						1			1
Concord.....	2,002	33	1			1							4
Deerpark.....	4,452	55								1	6	3	1
East Aurora.....	3,597	57	1	1		2		1	2	7	4		
East Hamburg.....	2,480	37	1							1	3		1
Eden.....	2,575	35						1		1		2	2
Elma.....	2,495	29								3	1		1
Evans.....	2,155	23		1							1		
Grand Island.....	2,867	33	1							1	4	1	2
Hamburg.....	972	6											3
Holland.....	5,879	85	1			1			1	2	4	3	1
LACKAWANNA.....	1,451	17											2
Lancaster.....	11,370	150				3			1	48	22	1	1
Lancaster.....	8,958	17		1						1	2		
Lancaster.....	3,893	39		1		2			1	5	6		
Marilla.....	1,513	19									2	2	1

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ERIE COUNTY—													
<i>(Continued)</i>													
Newstead	3,772	41							1	5	3	3	
North Collins	2,514	30							1	1	1	3	
Sardinia	1,843	24		1					1	1	3	1	
Tonawanda	1,511	26		1					1	3			
Wales	1,207	12											2
West Seneca	14,925	183	1			3			1	17	12		4
ESSEX COUNTY													
Chesterfield	2,117	46		6			18	9	3	26	48	6	31
Crown Point	1,890	28		1			1			1	4	1	2
Ellisburghtown	1,197	16								1	2		1
Essex	1,344	34						1		4	3	1	1
Jay	1,985	41							1	2	3	1	
Keene	1,328	16							1			1	2
Lake Placid	1,514	19								2	3		1
Lewis	1,049	21		1					1		1		4
Minerva	1,012	13									1		1
Morish	5,717	93		1			8			9	6		2
Newcomb	554	3											
North Elba	3,001	33		1					1	3	7		1
North Hudson	505	3											
St. Armand	879	13									8		
Schroon	1,213	15						1		1	1		
Ticonderoga	4,691	74					3			1	7		3
Westport	1,763	22		1							1	1	2
Willboro	1,629	19								1	1	1	
Wilmington	574	9								2			
FRANKLIN COUNTY													
Altamont	4,843	34		1		1	1	5	6	38	168	11	30
Bangor	2,184	22				1		3	4		2	1	
Belmont	2,403	22								1	2		1
Bombay	1,386	37								1	2		1
Brandon	920	16											
Brighton	704	17								1	3		2
Burke	1,875	22								1	2		5
Chateaugay	2,651	39		1						2		1	
Constable	1,355	30								2	2	1	1
Dickinson	1,763	26		2							2		3
Duane	372	1								1			
Fort Covington	2,080	42								1	3		1
Franklin	1,496	24								1	4	1	3
Harrietstown	4,113	11									3		
Malone	6,478	101		4						5	9	1	5
Malone	4,248	64	1	1						5	4	5	3
Mora	2,477	37		1						4			2
Santa Clara	1,053	4								1		1	
Saranac Lake	3,834	144		1			1			4	106		2
Tupper Lake	3,019	44	1	1						8			1
Waverly	2,190	35		1				2	2	1	4		
Westville	1,149	20								2	2		1
FULTON COUNTY													
GLOVERSVILLE	18,330	675	3	5	1	1		1	13	4	48	8	58
Bleecker	527	8				1		1	10	2	22	1	21
Broadalbin	1,933	26									4	1	5
Caroga	449	9											
Ephratah	1,479	27									1		1
JOHNSTOWN	9,845	155	1						2	1	10	2	18
Johnstown	2,493	53									6		5
Mayfield	2,129	37						1			2	3	3
Northampton	2,304	33		1						1	1		2
Oppenheim	1,358	17									2		2
Perth	676	4											
Sanford	652	6										1	

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GENESEE COUNTY.	35,878	534	1	4		4	1	4	7	18	37	13	16
Alabama.....	1,044	26							1				2
Alexander.....	1,417	20					1			1	2		1
Boswie.....	10,080	179		3		2		2	2	6	8	4	7
Batavia.....	2,301	19							1				1
Bergen.....	1,614	16									1		
Bethany.....	1,259	29									1	2	1
Byron.....	1,505	18								1	3		
Darien.....	1,850	31							2		2	1	
Elba.....	1,644	21									4		
Le Roy.....	3,395	57		1		2				2	6	1	
Le Roy.....	1,712	17								1	2		
Oakfield.....	1,802	24	1						1		1		1
Pavilion.....	1,546	28								2	2	2	1
Pembroke.....	2,449	40						1			4	2	
Stafford.....	1,319	9						1		1	1	1	
REENE COUNTY.	31,180	517	3	7	2	2		2	4	8	54	4	27
Ashland.....	647	9									1		2
Athens.....	2,816	37		1						1	7	1	1
Calro.....	1,900	71									7		5
Catskill.....	3,569	75	1		1					2	15		2
Catskill.....	5,294	73	1	1	1	1		1	1	2	9		4
Coxsackie.....	4,317	62	1	1				1		1	3	1	2
Durham.....	1,616	27		1							2		
Greenville.....	1,626	23		1						1	1	1	2
Haleotti.....	363	6											
Hunter.....	2,531	30						1	3	1	4		
Jewett.....	1,044	8											
Lexington.....	1,067	17		2							1		
New Baltimore.....	2,087	31									2		5
Prattville.....	761	9										1	3
Windham.....	1,437	25				1					2		1
HAMILTON COUNTY.	4,912	48						1	1		1		5
Arietta.....	295	2									1		
Benson.....	215	3											
Hope.....	317	4											
Indian Lake.....	1,049	7											
Inlet.....	108	2											
Lake Pleasant.....	494	3											
Long Lake.....	1,233	9							1				2
Morehouse.....	216	2											
Wells.....	925	11						1					
HERKIMER COUNTY.	53,856	770	2	6	1	2		2	5	40	80	5	40
Columbia.....	1,189	17								1	2		
Danube.....	934	8								1		1	
Fairfield.....	1,350	13			1						1		1
Frankfort.....	4,617	32											
Frankfort.....	2,956	44						2		6	2		3
German Flats.....	3,565	60							1	2	2	1	
Herkimer.....	6,596	114				1				9	5		6
Herkimer.....	1,227	36		1						1	2		1
Ilion.....	5,924	67								4	4		5
Litchfield.....	881	5											
LITTLE FALLS.....	11,122	183	2	1		1			3	14	18	2	9
Little Falls.....	685	5											
Manheim.....	2,837	27								1	5		3
Newport.....	1,680	20		1					1				4
Norway.....	686	6											
Ohio.....	704	11		1								1	1
Russia.....	2,056	23		1							1		1
Salsbury.....	1,373	25								1	1		
Schuyler.....	1,192	20									1		2
Stark.....	999	5						1					1

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HERKIMER COUNTY													
—(Continued)													
Warren	1,152	18											1
Webb	1,255	15									6		
Wilmurt	309	1											
Winfield	1,400	15		1									2
JEFFERSON COUNTY													
WATERTOWN	80,459	1,177	2	21	5	2		14	2	27	75	22	65
Adams	25,447	423		11	1	1		6	2	13	30	5	21
Alexandria	3,177	46	1								3	2	4
Antwerp	4,361	55								2	3	1	6
Brownville	2,932	39									2	1	2
Cape Vincent	3,904	47		2				1		1	3	2	2
Cortland	2,797	42	1	3						5	1	3	2
Champion	3,606	42						2		1	4		1
Clayton	2,698	30						1			1	1	1
Ellensburg	4,095	61		2	2			1		3	5	1	
Henderson	3,740	73		1							3		6
Hounsfield	1,517	17										1	1
Le Ray	2,346	33						3				1	1
Lorraine	2,694	32				1					2		5
Lyzne	949	8									2		
Orleans	2,098	27								1	2		2
Panama	2,433	33		1							3		2
Philadelphia	898	25									2		3
Rodman	1,699	22								1	2		1
Rutland	1,144	18									1		
Theresa	1,883	34		1							2		4
Watertown	2,022	28						1			2	2	1
Wilna	1,128	17											1
Worth	5,866	21										2	
	728	4											1
LEWIS COUNTY													
Croghan	26,647	369		6			1	3		6	9	10	
Denmark	2,963	25		1									
Diana	2,109	31						1				2	
Oneida	2,335	34		1						1			
Oriskany	911	15		1						1			
Harrisburg	721	5											
High Market	589	7											
Lewis	861	11					1						
Loyden	1,642	37								1	1	1	1
Lowville	3,921	71		1							4		1
Lyonsdale	1,062	10									3		
Martinsburg	1,749	23						1			1		1
Montague	616	8											
New Bremen	1,764	18								1		2	
Oscoda	513	4										1	
Pinekey	846	11								1			1
Turin	1,124	21		1				1				1	1
Watson	890	13										1	1
West Turin	1,963	25		1						1		1	1
LIVINGSTON CO.													
Avon	36,450	484		2		2		1	1	19	23	6	26
Caledonia	3,135	44				1		1		1	1	2	
Canaserota	2,230	37				1					2		1
Canaserota	1,099	18									1		
Canaserota	3,828	49									4		
Croftland	1,402	11		1									
Lewiston	1,414	26								2	2	1	1
Lima	2,202	35								1			
Livonia	2,744	37								1	4		
St. Morris	3,945	21											
North Danville	2,091	45		1					1	1	1		3
Danville	374	11								1	1		
	3,908	50								3	2		

Record of each reporting local board of health, showing total deaths, etc.— (Continued)

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NAME OF PLACE	Population, State census, 1905	All deaths	Cerebro-spinal meningitis	Typhoid fever	Malarial diseases	Scarlet fever	Measles	Whooping cough	Diphtheria	Diarrhea	Consumption	Influenza	Cancer
LIVINGSTON CO.—													
<i>(Continued)</i>													
Nunda.....	2,274	40								1	2		2
Oswan.....	802	7											
Portage.....	1,002	16											
Sparta.....	1,015	6								2			
Springwater.....	1,861	19										2	1
West Sparta.....	807	5											1
York.....	2,790	31									3	1	1
MADISON COUNTY...													
Brookfield.....	59,690	680	2	2		2	1		1	11	27	11	53
Brookfield.....	2,437	39		1					1	1	2		4
Cazenovia.....	3,328	41								2	1	1	3
Cazenovia.....	3,587	65									5	3	6
De Ruyter.....	1,301	19									1		
Eaton.....	2,474	61		1								1	4
Fenner.....	822	6											
Georgetown.....	896	11	1			1					3	1	
Hamilton.....	3,614	84								1	3	1	1
Lebanon.....	1,099	4											1
Lenox.....	5,009	31	1									1	2
Lincoln.....	1,000	12											
Oswego.....	8,420	139				1	1		1	2	5	1	10
Madison.....	1,977	22								1			
Nelson.....	1,136	8									1		
Smithfield.....	829	14										1	1
Stockbridge.....	1,576	22									1	1	
Sullivan.....	3,533	42								4	4		1
MONROE COUNTY...													
Rochester.....	239,454	3,738	11	23		22	55	27	51	231	534	14	209
Brighton.....	181,666	2,013	9	17		20	33	22	20	179	252	7	172
Chili.....	3,125	48				1			1		5		2
Clarkson.....	2,024	25								1	1		1
Fairport.....	1,567	14								1	3	1	1
Gates.....	2,640	45						1			1	3	1
Greece.....	3,739	44						1	1	2	1		3
Hamlin.....	6,242	129	1	1				2	2	32	6		3
Henrietta.....	2,171	19		1		1				1	1		1
Irondequoit.....	1,959	23											1
Mendon.....	3,160	46								6	2		3
Ogden.....	2,932	79								1	3		2
Parma.....	2,611	38		2							3		
Pembfield.....	2,905	40					1	1			4		6
Perinton.....	3,139	37	1							2	1		1
Pittsford.....	5,356	44							1				4
Riga.....	2,681	39									7		2
Rush.....	2,007	26								2		1	
Sweden.....	1,415	18					1		1	1	1		
Webster.....	1,289	14											
Wheatland.....	3,627	57							5	2	5	2	1
Wheatland.....	3,570	48		1						1	4		4
Wheatland.....	2,321	26		1							4		1
MONTGOMERY CO...													
Amsterdam.....	49,928	784	1	4	1	2			9	55	71	4	51
Amsterdam.....	23,943	423	1	3					9	50	38		25
Canajoharie.....	2,665	33								1	1		3
Charlotte.....	3,982	60								1	6		3
Florida.....	932	9									1		
Glen.....	2,012	24								1	3		2
Minden.....	2,191	31									4	1	5
Fort Plain.....	1,995	24			1						5		2
Mohawk.....	2,596	38									1	1	
Palatine.....	2,607	38									6		3
Root.....	2,410	43									4	1	2
St. Johnsville.....	1,607	19		1									3
St. Johnsville.....	2,973	42								2	2	1	3

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NASSAU COUNTY.....	69,477	1,114	9	11	2	5	4	9	25	60	84	8	51
Hempstead.....	34,746	411	4	4	1	1	2	4	10	12	28	3	16
North Hempstead.....	14,163	294	4	6	1	1	2	1	5	21	21	1	14
Oyster Bay.....	20,545	284	1	1	1	1	3	3	6	19	23	2	11
Rockville Center.....	2,952	49	1	1	1	1	1	1	2	1	8	5	5
Freeport.....	4,572	76	3	1	1	1	1	1	2	7	4	2	5
NEW YORK CITY OF	1,018,781	74,106	823	584	39	787	996	401	1,715	5,138	8,445	334	5,487
Bor. of Manhattan.....	2,112,380	37,961	182	282	7	359	388	220	962	2,547	4,206	166	1,827
Bor. of Bronx.....	271,830	6,426	32	63	3	49	58	34	103	304	1,623	16	295
Bor. of Brooklyn.....	1,358,886	24,365	96	191	24	327	508	118	557	1,825	2,348	138	1,110
Bor. of Queens.....	188,240	3,838	8	37	4	42	30	23	73	351	309	10	170
Bor. of Richmond.....	72,845	1,515	5	11	1	10	12	6	20	111	159	4	85
NIAGARA COUNTY.....	84,744	1,333	1	41	16	3	2	30	71	98	18	5	15
Lockport.....	17,553	276	9	1	5	2	1	3	3	23	6	10	10
NIAGARA FALLS.....	26,500	465	1	24	5	2	1	3	41	34	3	1	2
Cambria.....	1,782	21	1	1	1	1	1	1	1	1	1	1	1
Hartland.....	2,682	37	1	1	1	1	1	1	2	4	1	2	2
Lewiston.....	3,033	49	1	1	1	1	1	1	1	1	1	1	4
Lockport.....	2,371	67	1	1	1	1	1	1	1	1	1	1	4
Neckport.....	3,707	43	1	1	1	1	1	1	1	1	1	1	1
Newfane.....	1,322	16	1	1	1	1	1	1	1	1	1	1	1
Niagara.....	1,263	16	1	1	1	1	1	1	1	1	1	1	1
Pendleton.....	1,202	27	1	1	1	1	1	1	1	1	1	1	1
Porter.....	4,097	72	1	1	1	1	1	1	1	1	1	1	1
Royallton.....	2,009	25	1	1	1	1	1	1	1	1	1	1	1
Somersett.....	1,855	22	1	1	1	1	1	1	1	1	1	1	1
Westfield.....	10,157	162	6	1	3	1	1	7	12	2	1	10	2
N. TONAWANDA.....	2,993	35	1	1	1	1	1	1	1	1	1	1	2
Wilson.....	139,341	2,389	13	25	1	13	11	18	14	136	184	28	109
ONEIDA COUNTY.....	62,934	1,153	8	11	1	8	8	5	7	91	111	8	53
Utica.....	16,562	382	2	3	1	2	1	11	3	16	21	7	19
Rome.....	1,621	32	1	1	1	1	1	1	1	1	1	1	1
Annville.....	2,032	32	1	1	1	1	1	1	1	1	1	1	1
Augusta.....	909	9	1	1	1	1	1	1	1	1	1	1	1
Ava.....	3,167	46	1	1	1	1	1	1	1	1	1	1	1
Boonville.....	961	7	1	1	1	1	1	1	1	1	1	1	1
Bridgewater.....	3,750	58	1	1	1	1	1	1	1	1	1	1	1
Cumden.....	1,615	20	1	1	1	1	1	1	1	1	1	1	1
Deerfield.....	1,086	22	1	1	1	1	1	1	1	1	1	1	1
Florence.....	739	25	1	1	1	1	1	1	1	1	1	1	1
Floyd.....	1,457	25	1	1	1	1	1	1	1	1	1	1	1
Forestport.....	4,543	62	1	1	1	1	1	1	1	1	1	1	1
Kirkland.....	1,485	19	1	1	1	1	1	1	1	1	1	1	1
Lee.....	1,395	24	1	1	1	1	1	1	1	1	1	1	1
Marcy.....	1,762	18	1	1	1	1	1	1	1	1	1	1	1
Marshall.....	5,463	70	2	2	1	1	1	1	1	1	1	1	1
New Hartford.....	2,430	36	1	1	1	1	1	1	1	1	1	1	1
Paris.....	1,059	12	1	1	1	1	1	1	1	1	1	1	1
Remsen.....	2	2	1	1	1	1	1	1	1	1	1	1	1
Rome.....	2,246	32	1	1	1	1	1	1	1	1	1	1	1
Sangerfield.....	788	8	1	1	1	1	1	1	1	1	1	1	1
Steuben.....	2,532	34	1	1	1	1	1	1	1	1	1	1	1
Trenton.....	3,072	29	1	1	1	1	1	1	1	1	1	1	1
Vernon.....	3,636	54	1	1	1	1	1	1	1	1	1	1	1
Verona.....	1,958	24	1	1	1	1	1	1	1	1	1	1	1
Vienna.....	1,442	22	1	1	1	1	1	1	1	1	1	1	1
Western.....	2,067	30	1	1	1	1	1	1	1	1	1	1	1
Westmoreland.....	6,895	114	1	1	1	1	1	1	1	1	1	1	1
Whitestown.....	173,441	2,835	2	24	17	1	42	31	166	212	32	168	168
ONONDAGA COUNTY	117,593	1,947	1	14	15	1	35	26	136	145	13	114	6
SYRACUSE.....	2,586	46	1	1	1	1	1	1	1	1	1	1	1
Camillus.....	2,451	35	1	1	1	1	1	1	1	1	1	1	1
Cleora.....	2,451	35	1	1	1	1	1	1	1	1	1	1	1

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ONONDAGA COUNTY													
—(Continued)													
Clay	2,410	40		1					1		1		3
De Witt	6,252	44	1								1		2
<i>East Syracuse</i>	3,190	38						1		3	3		2
Elbridge	3,041	43		1						2	1		2
Fabius	1,545	25								1	2		3
Geddes	4,990	16								1		1	2
La Fayette	1,489	22						1			1		2
Lyander	1,418	44								1	1	2	4
<i>Baldwinsville</i>	2,961	37								1	3		1
Manlius	5,821	103						3		3	5	3	5
Marellus	2,744	36								1	3	2	1
Onondaga	5,824	164		1		1				5	27	2	12
Otisco	1,131	19							1				
Pompey	2,381	42		2					1	1	1		4
Salina	3,826	36		1				2			2		
Skaneateles	4,261	63		1						1	3	1	2
<i>Solway</i>	4,476	63					1		2	7	3		1
Spafford	1,130	20		1							1	1	1
Tully	1,463	24		2							1		
Van Buren	3,147	29				1					4		1
ONTARIO COUNTY													
Bristol	1,268	19		1			1				3	1	
Canadice	577	11								2	3		1
Canandaigua	2,236	32									2		4
<i>Canandaigua</i>	7,332	128		2	1					1	4	3	8
East Bloomfield	1,979	20							1		1		2
Farmington	1,611	15									1		3
Geneva	1,090	15											
GENEVA	12,249	175		2				1	1	4	15	4	7
Gorham	2,222	22					1						
Hopewell	1,470	20									1		
Manchester	4,809	86									3	2	9
Naples	2,350	23									1		1
Phelps	4,757	66								3	3	1	4
Richmond	1,320	27							1			3	2
Seneca	2,717	33		1						1	2		4
South Bristol	1,011	9						1			1	1	
Victor	2,387	32								1			
West Bloomfield	1,244	19									1		
ORANGE COUNTY													
Newburgh	26,496	482	1	13		2		2	2	13	45	3	17
MIDDLETOWN	14,516	256	2	3	1	2		1	3	6	20	4	12
Blooming Grove	2,099	24					1				1		1
Chester	2,128	34								2	3	1	2
Cornwall	4,860	65	1			1			2	6	6		3
Crawford	1,626	19									1	1	1
Deerpark	1,867	33							1		2		3
<i>Port Jervis</i>	9,695	183		2						3	8	5	8
Goshen	5,023	108		1		1			1	1	16	2	2
Greenville	672	12									1	1	1
Hamptonburg	1,158	21			1			1			1	1	
Highlands	3,561	73				1	1	1	1	7	5		
Ministink	1,354	20								1	1	1	
Monroe	2,038	39									4		
Montgomery	6,652	57		4				1	1	1	6		2
Mount Hope	1,128	28									3		1
Newburgh	4,785	71	1	2						8	4		3
New Windsor	2,887	38		1						2	4		2
Tuzedo	2,836	25								2			
Wallkill	2,736	32		1					1		2		1
Warwick	6,600	93		1	1	1		1	5	3	7	3	4
Wawayanda	1,574	9										1	

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ORANGE COUNTY—													
<i>(Continued)</i>													
Woodbury.....	1,822	38								1	3	3	3
Walden.....	3,973	58	1	3		1				1	9		2
ORLEANS COUNTY..													
<i>Albion</i>	51,323	445	1			5	1	2	1	16	49	6	25
Albion.....	5,174	64				2			1	2	7		2
Albion.....	1,225	45				1				3	3		1
Barre.....	1,879	26	1							1	2		
Carlton.....	2,236	24								1	2		2
Clarendon.....	1,455	26									4		5
Gaines.....	1,839	18						1			2	3	1
Holley.....		20				1				2	3		
Kendall.....	1,638	26										1	2
Murray.....	3,931	29					1			1	3		1
Ridgeway.....	1,016	24									5		2
Medina.....	5,114	98				1		1		4	10	1	4
Shelby.....	3,900	27									1		4
Yates.....	1,961	18								1			1
OSWEGO COUNTY...													
Oswego.....	70,110	1,118	1	12	1	2		12	2	54	68	29	54
Albion.....	22,572	336		6				5		17	22	3	23
Amboy.....	1,635	32								1	3	1	2
Boyleston.....	771	8									1		
Boyleston.....	743	13								1		1	1
Constantia.....	2,396	44		2							4		1
Granby.....	2,038	25	1							1	1		
Hannibal.....	2,369	41								1	1		1
Hastings.....	2,173	33									2		3
Mexico.....	3,079	60									2	1	3
New Haven.....	1,399	18								1	2	1	2
Orwell.....	1,029	18						1					
Oswego.....	2,550	53						2			2	5	
Palermo.....	1,361	15										1	1
Parish.....	1,383	22		1						1	2		1
Redfield.....	792	9											1
Richland.....	3,611	48				1			1		3	1	6
Sandy Creek.....	2,217	39			1							2	2
Schroepfel.....	2,886	45				1				1	3	4	
Scriba.....	2,246	31		1							1	1	3
Volney.....	2,339	28		1						1	1	1	
FULTON.....	8,847	167						4	1	9	8	4	2
West Monroe.....	914	14											1
Williamstown.....	954	19											1
OTSEGO COUNTY...													
Burlington.....	48,809	739	1	14		2	1		3	11	39	18	63
Butternuts.....	1,151	11								1			3
Butternuts.....	1,618	21									1		2
Cherry Valley.....	1,731	23									1		1
Decatur.....	502	8											
Edmeston.....	1,679	16								1			
Exeter.....	1,033	16											2
Hartwick.....	1,817	32		1							3	3	5
Laurens.....	1,600	23									1	1	1
Maryland.....	1,781	35									1	1	2
Middlefield.....	1,869	35	1										2
Millford.....	1,913	32									1	1	3
Morris.....	1,580	29								1	1		1
New Lisbon.....	1,088	10										1	1
Oneonta.....	1,874	13		1		1							1
Oneonta.....	8,054	152		7		1	1		2	5	11		7
Otego.....	1,708	23									1		2
Otego.....	2,036	23									1	2	2
Coopersburg.....	2,446	55		4						1	1		5
Pittsfield.....	970	13									1		1
Plainfield.....	389	11								1			2

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OTSEGO COUNTY—													
<i>(Continued)</i>													
Richfield.....	2,633	33									2		3
Roseboom.....	954	11									1		
Springfield.....	1,004	20											2
Unadilla.....	2,511	39		1							2	1	3
Westford.....	912	10									1		
Worcester.....	2,328	39							1	1	2	3	2
PUTNAM COUNTY.													
Carmel.....	14,169	371			1		2		1	6	28	3	16
Kent.....	2,601	56			1					1	8	2	3
Patterson.....	987	20									3		1
Phillipstown.....	1,680	21									1		
Putnam Valley.....	4,977	43							1	1	2		2
South East.....	949	27									5		3
South East.....	3,073	53									4	1	5
Cold Spring.....	2,447	51								3	5		2
RENSSELAER CO.													
Trout.....	122,637	1,805	11	30		9		15	8	65	250	26	130
Berlin.....	76,910	1,497	8	17		6		10	6	48	185	12	94
Brunswick.....	1,623	24		1						1	1	1	1
East Greenbush.....	2,714	42	1						1	1	1		1
Grafton.....	1,321	16				1						1	
Grafton.....	1,075	14									2		2
Rensselaer.....	10,715	174		4						7	12	3	12
Hoosick.....	2,966	44						1			6	1	2
Hoosick Falls.....	5,251	83	2					1		4	14	3	2
Nassau.....	1,991	38		1							3	1	
North Greenbush.....	1,222	26		1				1		1	3		2
Petersburg.....	1,350	16									3	1	
Pittsford.....	3,099	61		1				1		1	4		4
Poestenkill.....	1,143	12									2		
Sand Lake.....	2,205	40								1	7		2
Schaghticoke.....	3,181	34									4	1	2
Schoharie.....	4,424	69		4		2		1	1	1	2		6
Stephentown.....	1,424	25		1							1	2	
ROCKLAND COUNTY													
Clarkstown.....	45,088	677	1	4	5	2	8	11	11	31	44	5	39
Haverstraw.....	7,669	108			1		3		5	2	7		6
Orangetown.....	10,482	154		1	3			3	1	16	14		8
Nyack.....	8,427	106					5		4	2	8	2	9
Ramapo.....	4,441	74		1		1			1	4	4		7
Spring Valley.....	10,142	92				1		1			1	7	1
Stony Point.....	3,267	22	1					7			1		
Suffern.....	3,862	69		1	1					4	3		3
Suffern.....	3,069	52		1						1			3
ST. LAWRENCE CO.													
Ogdensburg.....	80,045	1,376	4	15		5	17	13	47	83	12		82
Brasher.....	13,179	245	2	4		3	3	3	9	17	2		18
Canton.....	2,333	33					1	1		1			1
Clare.....	6,798	100		2					2	2	1		5
Clifton.....	329	4									1		
Colton.....	1,717	22								1	3		
De Kalb.....	2,099	37	1	1					1	2	2		2
De Peyster.....	2,515	24								1			2
Edwards.....	952	10		1									
Fine.....	1,381	18									1		3
Fowler.....	2,371	41						2		2	5		1
Gouverneur.....	1,756	20		1						1	2	1	
Hammond.....	6,582	96		1				2	1	4	1		11
Herkimer.....	1,849	29						2			2	1	2
Hopkinton.....	1,505	15										1	
Lawrence.....	1,509	15											
Lisbon.....	800	25									3		2
Louisville.....	3,166	28					1			1	1		1
Louisville.....	1,553	21		1				2			1		3

Record of each reporting local board of health, showing total deaths, etc.— (Continued)

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NAME OF PLACE	Population, State census, 1905	All deaths	Cerebro-spinal meningitis	Typhoid fever	Malarial diseases	Scarlet fever	Measles	Whooping cough	Diphtheria	Diarrhea	Consumption	Influenza	Cancer
ST. LAWRENCE CO.—													
<i>(Continued)</i>													
Macomb	1,245	24									1		
Madrid	1,664	23					1				1		1
Massena	4,236	27								2	3		4
Massena	2,753	56		1				2	3	1	3		2
Morristown	1,333	20							1	1		1	
Norfolk	2,864	38		1				1	1	5	5		
Oswegatchie	2,303	18											
Parishville	2,111	35		1				1		3	1	1	4
Piercesfield	822	9											
Perrepoint	1,641	17									1		1
Pitcairn	965	17								3	1		1
Potsdam	4,830	52						1	1	2	8	2	4
Potsdam	4,162	61								4	5		9
Rossie	1,192	9											1
Russell	2,086	27		1						1	3		
Stockholm	2,711	32	1								6	2	2
Waddington	1,906	28							1		6		2
SARATOGA COUNTY.													
<i>Ballston Spa</i>	62,658	948	4	10	3	2	1	4	3	33	69	19	68
Ballston	4,181	58								9	5		
Ballston	1,481	18								1	1		1
Charlton	971	13											
Clifton Park	2,247	36		1		2			1	1		2	4
Corinth	3,272	47		2							1	1	1
Day	643	13										1	1
Edinburg	924	15		1						1	1		3
Galway	1,247	11											2
Greenfield	1,735	23							1	1	1		3
Hadley	776	9											2
Halfmoon	1,895	23		1									1
Malta	1,324	27								3	1		3
<i>Mechanicville</i>	5,877	78	1	1				1		4	9		6
Milton	2,427	55		1						3	6	8	1
Moreau	3,191	43								1	3		4
Northumberland	1,256	19											1
Providence	538	7								1			
Saratoga	3,979	57		1							11	3	3
Saratoga Springs	1,349	13						1			2		4
<i>Saratoga Springs</i>	12,969	249	2						1	2	16	7	17
Stillwater	3,346	42	1	1	2			1		2	4	1	2
Waterford	6,010	83		1			1	1		4	8		5
Wilton	1,004	9			1								
SCHENECTADY CO.													
Schenectady	71,334	988	2	8		21	1	4	8	30	98	8	36
Schenectady	58,787	846	1	8		20	1	4	8	75	86	7	31
Duanesburg	2,467	23									1		
Glenville	4,178	52								1	6	1	2
Niskayuna	1,445	19									1		1
Princeton	653	4											1
Rotterdam	4,198	44	1			1				3	4		1
SCHOHARIE COUNTY													
Blenheim	25,224	397	1	5		5		1	1	9	23	4	33
Blenheim	701	9											
Broome	1,064	21						1		1			5
Carle	1,091	21								1	1		1
Cobleskill	3,731	53		2						3			3
Conesville	734	10											1
Esperance	1,004	16									2		4
Fulton	1,611	18		1									1
Gilboa	1,425	27								1	2	1	3
Jefferson	1,304	21								1	1		2
Middleburg	2,666	34		1							1	1	2
Richmondville	1,537	27											
Schoharie	2,773	40									3	1	3

Record of each reporting local board of health, showing total deaths, etc.— (Continued)

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SCHOHARIE CO.—													
<i>(Continued)</i>													
Seward	1,458	28	1							1	1	1	4
Sharon	1,993	33				1			1	1	4		3
Summit	1,146	21		1							1		
Wright	1,060	18				4					2		1
SCHUYLER COUNTY.													
15,122	206			2				1		1	9	9	24
Catherine	1,298	15								1			
Cayuta	383	2									1		
Dix	3,909	54									3		8
Hector	3,888	49		2							1		5
Montour	1,650	28										1	4
Orange	1,197	15										1	1
Reading	1,412	21						1			1		3
Tyrone	1,411	22									3	1	3
SENECA COUNTY.													
25,316	408			4	1			1	4	6	27	3	24
Covert	1,954	23		1						1	2		4
Fayette	2,718	36									6		2
Junius	908	15									1		1
Lodi	1,540	23									1	1	
Orid	2,021	34											
Romulus	2,017	34											
Seneca Falls	811	8								2	1		
Seneca Falls	6,738	101		2					2	2	8	1	6
Tyre	808	13						1		1		1	1
Varick	1,196	20											2
Waterloo	474	21									3		2
Waterloo	4,123	72		1	1				2		5		6
STEBEN COUNTY.													
31,314	1,169	1	29	1	2	5	1	2	2	24	67	15	79
CORNING	13,515	217	19			1	2			2	12	1	9
HORNELL	18,259	185	1	3						1	12	2	9
Addison	2,564	53		1					1	1	3	1	4
Avoon	2,151	27								1	2		5
Bath	3,390	65					1			1	4		5
Bath	3,695	47		1			1				3		5
Bradford	620	8									4		2
Cameron	1,217	14										1	
Campbell	1,350	21								1			1
Canisteo	3,171	56		1					1	1	1		7
Caton	1,215	20										1	2
Cohocton	2,984	32			1					1	3		1
Corning	2,212	28				1				3			
Danville	1,370	16											5
Erwin	2,107	35								2	5		3
Freemont	914	9											1
Greenwood	1,082	13											3
Hartsville	664	5											
Hornby	940	12										1	
Hornellville	1,942	42		2						1	3	1	2
Howard	1,530	20					1					2	
Jasper	1,365	17									1		2
Lindley	1,174	15								1	1		1
Pattaburg	1,898	26								1	1	1	1
Pulteney	1,354	24									3		2
Rathbone	973	13										1	2
Thurston	927	12		1						1			
Troupsburg	1,725	21						1			1	2	2
Tuscarora	1,070	14								2			
Urbana	2,517	36		1									1
Wayland	2,700	38									1		3
Wayne	632	13									2		1
West Union	1,011	12									3		
Wheeler	1,006	8											
Woodhull	1,568	19											4

Record of each reporting local board of health, showing total deaths, etc.— (Continued)

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SUFFOLK COUNTY.	81,653	1,181	8	10		5	1	5	15	48	88	21	64
<i>Amherstville</i>	2,585	62		1							5		1
Babylon	7,919	94		1					2	3	9	1	1
<i>Babylon</i>	2,437	39								2	4		
Brookhaven	16,050	199		2						8	16	4	9
East Hampton	4,308	44							6	2		1	3
<i>Greensport</i>	2,787	32		1							4		1
Huntington	10,236	161	1			3		3	1	8	14	4	9
Lalip	13,721	163		4		1		1	1	9	10	3	10
<i>Patchogue</i>	3,654	47							4	1	3		6
Riverhead	4,950	57	1							4	1		4
Shelter Island	1,105	13								1	1		2
Smithtown	3,325	52		1			1	1			4	2	2
Southampton	7,976	109	1			1				6	6	3	8
<i>Sag Harbor</i>	3,042	34									1	2	4
Southold	8,989	63		1						2	4	1	4
SULLIVAN COUNTY.	34,786	628	1	9		2	1	6	1	15	152	10	21
Bethel	2,154	29									2		2
Callicoon	2,026	33	1	1				1			4		2
Corbecton	1,123	13						1		1			1
Delaware	1,814	26		1				1			4	1	
Fallsburg	3,810	57								3	9		3
Forestburg	544	18								1	3		
Fremont	2,110	36							1	4	2	1	1
Highland	975	15		1							1	1	1
Liberty	5,453	182		2				1		2	88		2
Lumberland	749	7										1	
Mamakating	3,199	59								1	5	3	1
Neversink	2,009	20		1							2		
Rockland	3,714	53		1		1		2		1	4	2	3
Thompson	4,166	96		1		1	1			1	26	1	5
Tusten	907	14		1							2		
TIOGA COUNTY.	26,907	455	3	8		1		2	4	8	16	14	25
<i>Waverly</i>	4,915	71		1					1	2	3	2	6
Barton	1,744	29						1			1	2	3
Berkshire	919	10											
Candor	3,148	54							1	1	1		5
Newark Valley	2,102	34		1							3	2	1
Nichols	1,456	30	1	1				1		1	1	4	1
Owego	2,994	65	1							1	1		3
<i>Owego</i>	5,010	94	1			1					4	3	4
Richford	1,001	12							2				
Spencer	1,596	27									1	1	
Tioga	2,017	29									1		2
TOMPKINS COUNTY.	34,151	501		4		2		1	8	12	53	13	41
<i>Ithaca</i>	14,615	211		3					6	6	13	3	14
Caroline	1,704	26				1							3
Danby	2,246	21								1		2	3
Dryden	3,710	43		1						2		1	3
Enfield	1,111	15									2	1	
Groton	3,210	40									5	3	4
Ithaca	1,573	28									2		3
Lansing	2,653	52							2	2	4	1	6
Newfield	1,665	14									4		
Ulysses	2,630	51						1		1	2	1	5
ULSTER COUNTY.	28,690	1,580	8	13	1		9	8	17	50	157	26	73
<i>Kingston</i>	25,556	519	5	8			1		9	12	62	5	22
Dennings	683	9								1	1	1	1
Esopus	4,786	58	2				1		5	3	3	3	1
Gardiner	1,437	33		1			1	2			1	1	1
Hardenburg	657	8								1			

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ULSTER COUNTY—													
<i>(Continued)</i>													
Hurley.....	1,677	23									4		2
Kingston.....	439	4											
Lloyd.....	2,722	57					2	2		5	3	4	4
Marbletown.....	2,968	65		2			1	1		2	2		2
Marlborough.....	3,917	59					1	1		4	2	2	2
New Paltz.....	2,162	59					1	1		2	2	3	3
Olive.....	2,347	70							1	3	2		5
Plattekill.....	1,823	25						1			2		4
Rochester.....	2,822	40								1	7		2
Rosendale.....	4,670	65					1			1	5		2
Saugerties.....	5,914	85								5	13		6
Shawangunk.....	3,833	61							2	2	7	1	3
Shandaken.....	3,045	52	1						1	1	1	1	5
Shawangunk.....	2,467	42			1		2		1	1	4		4
Ulster.....	3,797	46		1					2	2	5		4
Wawarsing.....	4,343	67							1	3	4		2
Ellenville.....	2,872	54		1						1	4		2
Woodstock.....	1,665	19							1		2		1
WARREN COUNTY.													
Boiton.....	31,585	502	2	5					1	11	45	4	36
Bolton.....	1,561	13									2	1	1
Caldwell.....	1,499	28									4		1
Chester.....	1,965	33		2							3		3
Hague.....	1,054	14								1			2
Horicon.....	1,114	16		1						1	3		1
Johnsburg.....	2,364	36	1								1		1
Luzerne.....	3,371	22		1						1		1	1
Queensbury.....	2,131	37								2	3	1	2
Glen Falls.....	14,650	226	1	1					1	6	24	1	17
Stony Creek.....	910	12									1		1
Thurman.....	833	13											2
Warrensburg.....	2,483	52									2		4
WASHINGTON CO.													
Argyle.....	47,376	738	1	10		4	5	1	9	42	56	15	45
Cambridge.....	1,821	28	1								4		2
Dresden.....	1,850	43		1						2		1	5
Easton.....	620	5											1
Fort Ann.....	2,210	20								1	1		
Fort Edward.....	2,250	44		1			1		2	4	1		4
Hudson Falls.....	5,300	70		2					2	5	1	1	3
Granville.....	5,321	72					1		2	4	3	1	3
Greenwich.....	6,487	84		2		1			1	6	3	3	7
Hampton.....	4,338	75				2			1	4	7	4	2
Hartford.....	671	5											
Hebron.....	1,270	18								1	3		2
Jackson.....	1,599	22		1							1		1
Kingsbury.....	1,052	20								2	1		1
Putnam.....	1,713	31								1	3	1	
Salem.....	507	9								2			1
White Creek.....	2,802	45									2		1
Whitehall.....	2,425	28		1							1		1
Whitehall.....	980	11									3		
Whitehall.....	4,148	102		2		1	3	1	2	10	2	2	9
WAYNE COUNTY.													
Newark.....	48,554	789	5	8			2	6	6	20	36	11	49
Arcadia.....	4,554	84						2	1	3	5		7
Butler.....	2,556	25							4		1		3
Galen.....	1,704	31									2		
Clyde.....	1,908	35		1							3		
Huron.....	2,552	41									5	1	3
Lyons.....	1,592	24					1				1	1	1
Macedon.....	909	29									3		
Macedon.....	2,615	39		1						7	1	1	2

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WAYNE COUNTY—													
<i>(Continued)</i>													
Marion.....	2,025	27	2	1
Ontario.....	2,504	38	1	2	3
Palmira.....	4,042	57	1	2	3	4
Rose.....	1,888	35	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	1
Savannah.....	1,682	27	.....	.....	.....	.....	.....	2	.....	2	2	1	3
Sodus.....	4,997	83	.....	.....	.....	.....	.....	1	1	2	2	.....	7
Walworth.....	2,156	26	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	1
Williamson.....	2,912	41	.....	.....	.....	.....	1	.....	.....	1	2	.....	1
Wolcott.....	3,105	61	2	2	.....	.....	.....	1	.....	.....	1	3	2
Ligon.....	4,758	86	2	2	.....	.....	.....	.....	.....	1	1	2	11
WESTCHESTER CO..													
YONKES.....	228,860	4,048	12	28	5	45	17	24	52	358	363	20	218
MOUNT VERNON.....	61,716	1,125	3	5	3	18	1	.....	18	141	107	1	43
Bedford.....	25,006	302	1	2	1	.....	3	5	5	35	29	.....	21
Cortlandt.....	4,759	76	.....	.....	.....	.....	.....	.....	.....	5	18	1	3
Doyle Ferry.....	7,829	110	.....	.....	1	.....	1	.....	.....	12	8	1	5
Pestakill.....	3,640	76	.....	1	.....	1	.....	.....	.....	7	6	.....	1
East Chester.....	13,200	247	.....	2	.....	.....	.....	1	.....	23	17	1	12
Greenburgh.....	3,986	84	.....	1	.....	.....	.....	4	2	4	4	3	1
Harrison.....	18,635	61	1	.....	.....	.....	.....	.....	.....	5	4	.....	4
Hastings-on-Hudson.....	2,922	48	.....	1	.....	.....	.....	4	.....	3	3	.....	1
Irvington.....	3,482	45	.....	.....	.....	.....	.....	.....	.....	5	6	.....	.....
Lewisboro.....	2,578	22	.....	.....	.....	.....	.....	2	.....	.....	.....	.....	.....
Mamaroneck.....	1,542	11	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Mount Pleasant.....	563	93	1	.....	.....	.....	2	.....	.....	6	6	1	4
New Castle.....	9,728	259	1	.....	.....	.....	.....	2	2	3	62	.....	61
New Rochelle.....	2,956	44	.....	1	.....	.....	.....	.....	.....	2	1	2	3
North Castle.....	20,480	323	2	6	.....	1	1	2	7	24	23	1	13
North Salem.....	1,483	16	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	3
North Tarrytown.....	1,169	18	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	1
Ossining.....	4,851	80	.....	.....	.....	.....	4	3	1	12	10	1	1
Pelham.....	3,181	12	.....	.....	.....	.....	.....	3	.....	.....	.....	.....	1
Poundridge.....	7,135	182	1	4	.....	.....	1	3	10	14	14	3	7
Port Chester.....	1,841	24	.....	.....	.....	.....	.....	.....	.....	1	1	.....	1
Rye.....	798	20	.....	.....	.....	.....	.....	.....	.....	1	1	.....	3
Scarsdale.....	11,198	204	2	1	.....	.....	5	1	3	26	8	3	8
Somers.....	6,879	66	.....	.....	.....	1	.....	.....	.....	4	7	.....	5
Tarrytown.....	1,018	16	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
White Plains.....	1,175	24	.....	.....	.....	1	.....	.....	3	1	1	.....	2
Yorktown.....	5,610	84	.....	2	.....	.....	.....	1	1	2	7	.....	2
.....	550	7	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	11,579	238	.....	2	.....	15	.....	2	3	19	16	1	9
.....	2,294	46	.....	.....	.....	5	.....	.....	.....	.....	2	.....	2
WYOMING COUNTY.													
Arcade.....	31,355	480	.....	2	.....	1	1	2	.....	14	15	11	25
Attica.....	1,939	32	.....	1	.....	.....	.....	1	.....	.....	.....	.....	3
Bennington.....	2,721	45	.....	.....	.....	.....	.....	.....	.....	3	.....	5	3
Castile.....	1,861	17	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	1
Covington.....	2,386	39	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	3
Eagle.....	957	12	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	1
Gainesville.....	1,152	16	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....
Genesee Falls.....	2,538	27	.....	.....	.....	.....	.....	.....	.....	2	2	1	1
Java.....	633	9	.....	.....	.....	.....	.....	.....	.....	1	1	.....	.....
Middlebury.....	1,663	24	.....	.....	.....	.....	.....	.....	.....	1	1	1	1
Orangeville.....	1,378	19	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....
Perry.....	890	16	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2
Pike.....	760	22	.....	.....	.....	.....	.....	.....	.....	2	.....	1	2
Sheldon.....	4,143	50	1	2	2	1
Warren.....	1,231	13	1
Wethersfield.....	1,742	25	1	3	1	2
.....	4,409	49	1	1	1	1	2	2
.....	869	5	1

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YATES COUNTY.....	19,408	267	7	4	17	6	8
Barrington.....	1,119	11	1
Benton.....	2,137	21	2	1	1
Italy.....	897	15	2	2
Jerusalem.....	2,554	43	3	1	1
Middlesex.....	1,302	12	3	1
Milo.....	1,570	21	1	1
Pesa Yan.....	4,504	78	2	3	7	3
Potter.....	1,568	18	1
Starkey.....	2,842	36	3	1	3
Torrey.....	1,001	18
State prisons.....	52	16
State Hospitals for In- sane.....	1,730	1	1	255	1	43
Other public institutions	428	2	71	2	14

Deaths by Causes 1885 to Date

YEAR	All deaths	Death rate	Deaths under five years of age	EPIDEMIC DISEASES		
				Cerebro-spinal meningitis	Typhoid fever	Malarial diseases
1885	80,407	14.3	30,027	446	1,067	944
1886	86,801	15.2	32,928	572	1,169	899
1887	108,269	18.6	35,114	540	1,327	935
1888	114,584	19.3	38,345	490	1,483	813
1889	113,155	18.6	40,243	402	1,560	746
1890	128,648	20.8	37,392	474	1,612	738
1891	129,350	20.5	42,740	589	1,926	619
1892	131,388	20.3	42,434	649	1,664	613
1893	129,659	19.7	41,643	875	1,685	493
1894	123,423	18.6	41,472	489	1,640	422
1895	128,834	19.1	42,002	546	1,716	409
1896	126,253	18.4	40,136	510	1,542	449
1897	118,525	17.1	35,771	538	1,351	380
1898	122,584	17.4	37,113	695	1,810	404
1899	121,831	17.0	35,886	702	1,604	248
1900	132,352	18.2	39,204	531	1,948	309
1901	131,461	17.7	35,775	492	1,741	283
1902	124,657	16.4	31,215	456	1,318	189
1903	127,602	16.4	32,768	454	1,665	137
1904	142,014	17.8	39,086	1,708	1,652	149
1905	137,222	17.0	38,045	2,566	1,554	106
1906	140,773	17.1	39,292	1,178	1,568	139
1907	147,890	17.6	40,168	230	1,673	126
1908	138,912	16.3	37,941	539	1,375	84
1909	140,261	16.1	38,278	485	1,315	78

Deaths by Causes 1885 to Date — (Continued)

YEAR	EPIDEMIC DISEASES — (Continued)						
	Small-pox	Scarlet fever	Measles	Erysipelas	Whooping cough	Croup and diphtheria	Diarrhea
1885	33	1,184	1,170	354	834	4,508	7,301
1886	39	1,011	895	357	1,244	5,597	7,028
1887	175	1,267	1,205	327	447	6,490	9,258
1888	212	2,452	944	342	994	6,448	8,774
1889	30	2,205	899	293	1,303	5,555	8,294
1890	4	913	1,161	312	1,156	4,915	8,468
1891	4	2,252	1,200	367	825	5,072	9,179
1892	143	2,177	1,350	477	921	5,918	9,185
1893	252	1,626	789	366	1,203	5,947	9,056
1894	308	1,227	900	331	1,020	6,592	8,956
1895	11	850	1,266	370	1,169	4,939	9,055
1896	3	759	1,495	340	996	4,597	8,776
1897	27	841	873	303	825	4,115	7,267
1898	1	837	838	237	1,155	2,612	8,499
1899	21	730	756	353	886	2,796	6,480
1900	14	689	1,333	466	1,020	3,306	7,959
1901	445	1,430	859	363	721	3,026	9,337
1902	442	1,215	929	314	923	2,539	8,315
1903	41	1,057	721	354	811	3,035	7,480
1904	13	1,194	1,170	430	426	3,041	8,329
1905	9	726	988	415	847	2,296	8,955
1906	7	690	1,369	452	821	2,691	8,578
1907	10	1,032	997	483	789	2,603	9,213
1908	3	1,688	1,175	419	503	2,473	9,111
1909	4	1,205	1,272	472	783	2,313	7,873

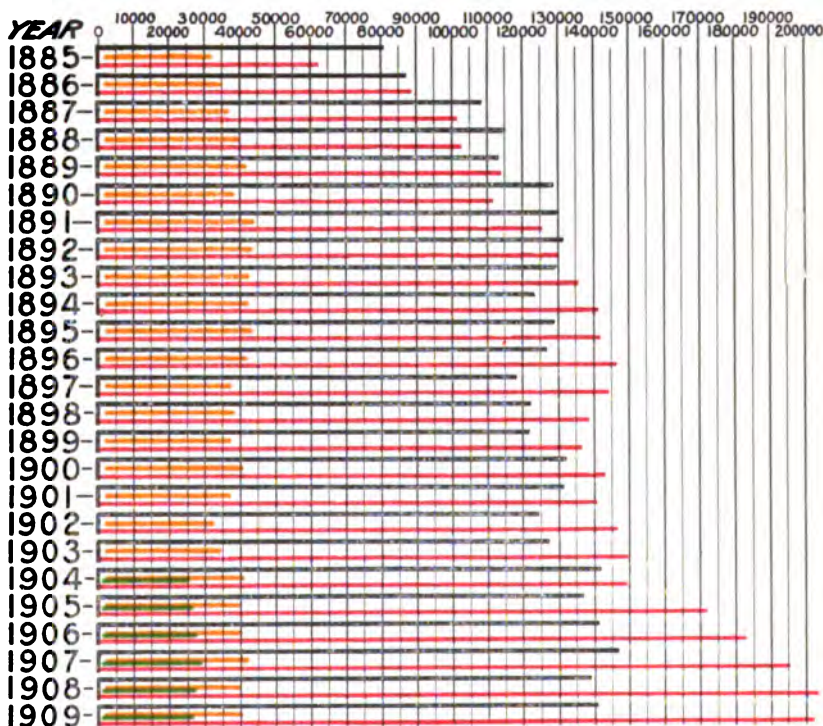
Deaths by Causes 1885 to Date — (Continued)

YEAR	OTHER CAUSES OF DEATH				
	Con- sumption	Acute respiratory diseases	Puerperal	Digestive	Urinary
1885	11,238	10,864	974	4,343	4,069
1886	11,947	11,389	884	5,066	4,305
1887	11,609	11,557	885	5,599	4,582
1888	12,383	13,756	1,069	6,146	4,926
1889	12,390	13,833	979	6,501	5,732
1890	13,831	18,053	928	7,696	5,688
1891	13,445	20,647	1,053	8,486	6,473
1892	13,471	20,432	1,131	8,920	6,502
1893	13,123	19,807	1,054	8,834	6,955
1894	12,824	18,885	911	8,745	6,946
1895	13,267	17,725	939	8,892	7,449
1896	13,265	16,820	972	8,955	7,770
1897	12,641	16,277	1,013	8,963	7,866
1898	12,979	16,350	920	10,101	8,641
1899	13,412	17,938	877	10,163	9,064
1900	13,590	19,232	1,136	10,644	9,501
1901	13,766	17,589	1,068	7,478	9,553
1902	12,582	16,986	1,034	7,235	9,604
1903	13,194	17,339	1,110	7,282	9,998
1904	14,159	21,132	1,272	7,866	10,815
1905	14,061	17,832	1,377	8,158	10,697
1906	14,027	20,178	1,326	8,741	11,344
1907	14,431	22,663	1,413	9,035	12,163
1908	14,347	18,477	1,335	8,398	11,329
1909	13,996	20,829	1,333	8,791	12,196

Deaths by Causes 1885 to Date — (Concluded)

YEAR	OTHER CAUSES OF DEATH — (Concluded)					
	Circula- tory	Nervous	Cancer	Violence	Old age	Unclass- ified
1885	4,069	8,651	1,887	2,994	4,889	7,728
1886	5,238	8,799	2,050	3,296	5,900	8,981
1887	5,737	9,957	2,363	3,780	8,676	9,736
1888	6,394	11,174	2,497	3,842	7,994	11,310
1889	6,886	11,266	2,638	3,834	5,980	12,615
1890	7,306	11,593	2,868	4,542	5,484	18,728
1891	8,480	13,166	3,028	5,028	6,530	15,371
1892	9,013	14,009	3,152	5,543	6,385	14,647
1893	9,042	13,826	3,232	5,295	5,826	14,622
1894	8,451	12,948	3,305	5,487	5,497	15,310
1895	9,966	11,724	3,554	5,889	5,569	16,380
1896	10,486	11,925	3,789	7,022	5,377	14,835
1897	10,905	12,124	4,131	6,172	5,516	14,950
1898	10,511	13,312	4,385	6,520	5,524	14,641
1899	10,606	13,177	4,533	6,093	6,068	15,324
1900	10,676	12,903	4,871	6,714	5,402	16,134
1901	11,949	13,366	5,033	7,926	5,439	17,388
1902	12,889	12,964	4,990	7,058	4,949	15,833
1903	12,561	12,966	5,456	7,646	4,765	17,466
1904	14,309	14,142	5,697	8,822	5,120	19,858
1905	14,547	13,569	6,056	8,352	4,923	19,025
1906	15,395	13,521	6,168	8,874	4,332	18,944
1907	16,952	14,539	6,420	9,668	2,723	20,717
1908	17,233	11,989	6,554	9,183	2,516	20,181
1909	18,784	11,191	7,060	9,232	2,189	18,860

BIRTHS AND INFANT MORTALITY. NEW YORK STATE.



MORTALITY UNDER ONE YEAR.
 1908- URBAN RURAL
 1909- URBAN RURAL

— TOTAL MORTALITY.
 — MORTALITY UNDER 5 YEARS.
 — (MORTALITY UNDER 1 YEAR.
 NOT CLASSIFIED SEPARATELY UNTIL 1904.
 — TOTAL BIRTHS.

NEW YORK STATE DEPARTMENT OF HEALTH.



Infant Mortality

The following table shows the mortality among children under five and infants under one year of age, and also relation to total deaths at all ages and in their relation to the total births.

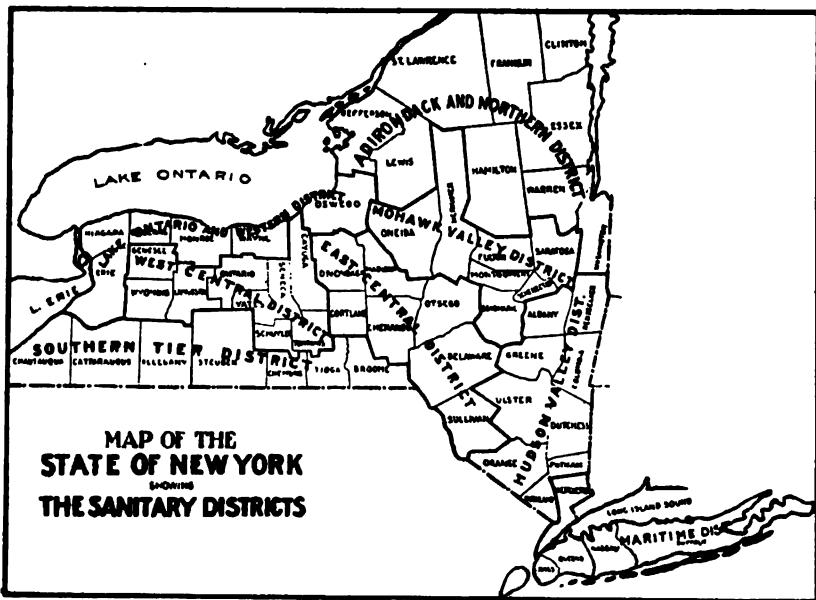
	Total mortality	Mortality under five† years	Under one year*	Total births	Annual number of deaths under one year to 1,000 living births	Percentage under one year to total deaths	Percentage of deaths five years to total deaths
1885	80,407	30,027		63,536			37.3
1886	86,801	32,928		89,828			37.9
1887	108,269	35,114		102,038			32.4
1888	114,584	38,345		103,089			33.5
1889	113,155	40,243		114,804			35.5
1890	128,648	37,392		112,572			29.1
1891	129,850	42,740		125,909			32.9
1892	131,338	42,434		130,143			32.3
1893	129,659	41,643		136,297			32.1
1894	123,433	41,472		141,827			33.6
1895	128,834	42,002		142,311			32.6
1896	126,253	40,136		147,327			31.7
1897	118,525	35,771		144,631			30.1
1898	122,594	37,113		138,702			30.2
1899	121,831	35,386		136,778			29.0
1900	132,089	39,204		143,156			29.6
1901	131,335	35,775		140,539			27.2
1902	124,830	31,215		146,740			25.0
1903	127,498	32,768		158,343			25.7
1904	142,217	†14,177	24,909	165,014	151.0	17.5	27.5
1905	137,435	12,218	25,827	172,259	150.0	18.8	27.7
1906	141,099	12,176	27,114	183,012	148.1	19.2	27.9
1907	147,130	12,157	28,011	196,020	142.9	19.0	27.8
1908	138,912	11,380	26,561	203,159	130.7	19.1	27.3
1909	140,261	12,201	26,077	202,656	128.6	18.6	27.8

* Until 1904, deaths under one year were not classified separately.

† Mortality one to five years.

Mortality under one year

1908	Rural....	4,685	1909	Rural....	4,592
	Urban....	21,876		Urban....	21,485



Population of the Sanitary Districts

DISTRICTS	1890	1900	1905	1907	1908	1909
Maritime	2,743,959	3,753,614	4,393,861	4,686,262	4,776,624	4,881,466
Hudson Valley	679,647	690,000	703,893	710,579	711,302	729,735
Adirondack and Northern	378,577	394,772	408,116	413,178	415,502	419,564
Mohawk Valley	368,503	408,974	444,741	480,528	466,495	466,973
Southern Tier	401,864	428,543	438,936	442,574	446,042	449,936
East Central	382,954	401,082	414,209	419,076	421,941	425,973
West Central	314,876	315,945	315,677	314,433	317,252	320,101
Lake Ontario and Western	727,473	876,206	947,875	978,703	991,198	1,005,895
Entire State	5,997,853	7,269,186	8,067,308	8,425,333	8,546,356	8,699,643

Relative Area, Density of Population and Death Rates in the Sanitary Districts for 1909

DISTRICTS	Area in square miles (land)	Population per square mile	Urban death rate	Rural death rate	Total death rate	PERCENTAGE OF DEATHS			
						Under 1 year	Between 1 and 5 years	At 60 years and over	From epidemic diseases
Maritime	1,946	2,508	16.6	16.5	16.6	21.2	11.3	22.3	7.2
Hudson Valley	5,679	128	18.0	15.9	16.9	14.2	5.3	40.7	5.0
Adirondack and Northern	13,358	31	15.4	14.8	15.0	16.1	5.0	44.2	5.4
Mohawk Valley	5,179	90	15.4	15.1	15.2	17.0	4.9	41.6	4.7
Southern Tier	6,419	70	13.8	16.6	15.5	11.3	3.9	51.3	5.9
East Central	6,252	68	15.3	15.7	15.5	13.3	3.8	47.5	5.0
West Central	4,588	69	14.4	15.4	15.2	10.4	3.1	51.9	4.5
Lake Ontario and Western	4,199	239	15.1	14.9	15.0	18.3	7.3	34.3	5.6
Entire State	47,620	182	16.3	15.6	16.1	18.6	8.7	30.9	6.4

Mortality in the Sanitary Districts 1885-1909 — Maritime District

YEAR	All deaths	Death rate	Deaths under five years of age	EPIDEMIC DISEASES		
				Cerebro-spinal meningitis	Typhoid fever	Malarial diseases
1885.	55,021		22,426	233	488	718
1886.	57,420		24,668	246	483	667
1887.	61,715		25,289	232	528	658
1888.	64,421		27,513	201	558	519
1889.	65,037		27,691	243	638	468
1890.	67,512		28,781	170	625	444
1891.	74,681		30,680	311	658	381
1892.	74,590		30,905	364	634	412
1893.	75,027		29,561	652	657	337
1894.	71,055		29,826	254	561	305
1895.	74,246	21.2	30,303	335	566	281
1896.	75,789	21.5	29,122	291	594	333
1897.	67,646	18.9	25,804	332	585	285
1898.	71,196	20.0	28,008	401	724	296
1899.	70,384	18.4	25,751	414	578	185
1900.	75,989	19.5	27,625	310	760	240
1901.	76,030	20.0	25,649	257	775	222
1902.	73,325	18.6	25,494	264	809	185
1903.	73,011	18.0	22,926	271	697	100
1904.	84,164	20.0	28,445	1,432	726	111
1905.	79,671	18.2	26,173	2,142	714	67
1906.	82,544	18.2	27,427	546	689	85
1907.	86,155	18.4	27,644	26	808	69
1908.	79,768	17.1	25,808	369	615	49
1909.	80,981	16.6	26,262	347	613	46

Mortality in the Sanitary Districts 1885-1909 — Maritime District — (Continued)

YEAR	EPIDEMIC DISEASES — (Continued)						
	Small-pox	Scarlet fever	Measles	Erysipelas	Whooping cough	Diphtheria	Diar-rhea
1885.	28	989	948	230	694	3,207	5,828
1886.	37	790	790	223	880	4,103	5,243
1887.	171	933	988	217	283	4,654	6,501
1888.	153	2,012	670	240	820	4,378	5,900
1889.	.....	1,661	700	209	993	4,098	5,596
1890.	2	562	972	216	681	3,314	5,576
1891.	1	1,858	940	243	678	3,466	6,146
1892.	142	1,499	1,093	278	640	3,573	6,422
1893.	252	939	538	227	905	3,837	5,998
1894.	281	784	829	206	594	5,066	5,647
1895.	11	626	1,023	238	853	3,830	5,992
1896.	3	566	1,106	200	722	3,403	5,413
1897.	27	726	621	192	508	2,881	4,744
1898.	1	727	529	150	801	1,736	5,285
1899.	18	550	600	241	565	2,008	3,905
1900.	11	479	863	325	616	2,393	4,292
1901.	426	1,178	469	208	334	2,147	7,114
1902.	322	968	737	193	661	2,111	6,187
1903.	7	758	520	205	376	2,262	5,465
1904.	9	877	916	265	227	2,139	6,322
1905.	9	494	552	269	454	1,652	6,593
1906.	6	513	1,184	313	434	1,971	6,135
1907.	9	823	743	315	450	1,842	6,846
1908.	1	1,385	1,007	259	206	1,859	6,486
1909.	3	825	1,033	330	439	1,807	5,598

Mortality in the Sanitary Districts 1885-1909 — Maritime District — (Continued)

YEAR	OTHER CAUSES OF DEATH				
	Con- sumption	Acute respiratory diseases	Puerperal	Digestive	Urinary
1885	7,896	8,036	648	2,813	3,095
1886	8,069	8,269	557	3,034	3,241
1887	7,546	8,517	560	3,457	3,480
1888	7,996	9,654	650	3,643	3,589
1889	8,014	9,619	599	3,866	3,491
1890	8,621	7,504	588	4,379	3,886
1891	8,373	13,638	666	4,737	4,334
1892	8,250	12,771	716	5,105	4,260
1893	8,359	13,472	600	5,099	4,583
1894	7,796	10,414	521	5,266	4,416
1895	8,319	11,683	513	5,463	4,755
1896	8,314	11,328	591	5,374	4,920
1897	7,204	9,768	536	5,221	4,938
1898	8,191	10,677	533	6,314	5,368
1899	8,546	11,264	529	6,309	5,813
1900	8,650	13,240	744	6,804	6,115
1901	8,730	11,010	656	3,270	6,171
1902	8,080	11,798	662	3,242	6,141
1903	8,582	11,620	688	3,113	6,255
1904	9,124	14,665	848	3,471	6,926
1905	9,906	11,946	875	3,812	6,616
1906	9,540	13,694	824	4,324	7,063
1907	9,880	14,981	837	4,421	6,892
1908	9,517	12,063	761	4,106	6,190
1909	9,252	13,687	770	4,369	6,802

Mortality in the Sanitary Districts 1885-1909 — Maritime District — (Continued)

YEAR	OTHER CAUSES OF DEATH — (Concluded)					
	Circula- tory	Nervous	Cancer	Violence	Old age	Unclassified
1885	2,863	5,252	1,087	1,989	2,909	5,056
1886	2,941	5,329	1,171	2,094	3,076	6,138
1887	3,197	6,102	1,317	2,289	3,437	6,652
1888	3,486	6,729	1,349	2,126	2,177	7,646
1889	3,653	6,665	1,358	2,157	1,491	8,897
1890	3,872	6,691	1,543	2,507	1,518	10,468
1891	4,368	7,123	1,522	2,900	1,569	10,791
1892	4,469	7,463	1,609	3,225	1,620	10,043
1893	4,609	7,558	1,614	3,030	1,543	10,218
1894	4,189	6,851	1,655	3,282	1,442	10,701
1895	5,413	5,580	1,805	3,784	1,371	11,764
1896	5,586	5,570	1,894	4,684	1,459	10,522
1897	5,455	5,435	2,031	3,672	1,322	10,813
1898	5,020	6,370	2,174	3,901	1,417	10,298
1899	4,788	6,255	2,302	3,639	1,594	10,281
1900	4,931	6,049	2,449	4,150	1,456	11,112
1901	5,888	6,241	2,651	4,996	1,455	11,832
1902	6,438	5,970	2,557	4,074	1,307	10,666
1903	6,445	5,775	2,828	4,405	1,025	11,614
1904	6,882	6,631	2,967	5,514	1,187	12,775
1905	7,159	6,331	3,151	4,812	984	12,153
1906	7,789	6,162	3,288	5,214	1,084	11,356
1907	9,491	6,756	3,514	5,729	766	11,407
1908	9,938	4,731	3,564	5,504	746	10,412
1909	10,871	3,771	3,841	5,295	*	11,282

* Included with unclassified causes.

Mortality in the Sanitary Districts 1885-1909 — Hudson Valley District

YEAR	All deaths	Death rate	Deaths under five years of age	EPIDEMIC DISEASES		
				Cerebro-spinal meningitis	Typhoid fever	Malarial diseases
1885.....	8,941	.....	2,688	86	249	95
1886.....	9,639	.....	2,991	145	263	64
1887.....	9,895	.....	2,864	135	270	79
1888.....	11,015	.....	3,248	93	355	80
1889.....	11,106	.....	3,222	58	267	96
1890.....	10,893	.....	2,713	67	222	87
1891.....	12,209	.....	3,092	71	372	85
1892.....	13,147	.....	5,411	79	248	60
1893.....	12,174	.....	3,074	70	288	65
1894.....	11,733	.....	2,966	69	264	54
1895.....	12,148	18.7	3,217	70	402	49
1896.....	12,316	19.0	2,975	52	314	50
1897.....	11,822	17.7	2,625	52	247	36
1898.....	11,776	17.6	2,574	92	332	49
1899.....	11,854	17.0	2,499	84	318	31
1900.....	12,432	17.4	2,870	55	350	27
1901.....	11,926	17.5	2,309	43	238	32
1902.....	11,070	16.0	2,150	35	251	25
1903.....	11,619	16.7	2,175	34	178	19
1904.....	12,451	18.0	2,450	73	246	14
1905.....	12,408	17.6	2,542	126	206	11
1906.....	12,026	17.0	2,334	108	184	26
1907.....	12,925	18.2	2,551	44	194	22
1908.....	12,333	17.2	2,450	37	155	21
1909.....	12,322	16.9	2,401	39	146	13

Mortality in the Sanitary Districts 1885-1909 — Hudson Valley District — (Continued)

YEAR	EPIDEMIC DISEASES — (Continued)						
	Small-pox	Scarlet fever	Measles	Erysipelas	Whooping cough	Diphtheria	Diar-rhea
1885.....	3	63	109	25	48	580	560
1886.....	1	70	70	32	141	597	612
1887.....	4	109	49	25	41	579	706
1888.....	7	231	48	23	85	708	740
1889.....	.....	324	108	18	68	722	681
1890.....	1	48	6	26	159	363	443
1891.....	.....	94	84	24	102	378	720
1892.....	.....	299	113	50	46	741	783
1893.....	.....	213	41	27	86	507	690
1894.....	20	161	28	19	142	367	741
1895.....	.....	84	96	34	110	340	767
1896.....	.....	31	125	45	68	329	891
1897.....	.....	11	32	23	50	327	610
1898.....	.....	25	17	19	105	212	714
1899.....	1	26	53	30	75	231	635
1900.....	.....	41	134	36	120	259	843
1901.....	6	79	56	25	49	234	471
1902.....	14	50	20	14	88	175	467
1903.....	1	86	35	30	104	136	384
1904.....	.....	35	94	22	58	163	451
1905.....	.....	44	119	23	93	149	537
1906.....	.....	17	56	27	76	162	422
1907.....	.....	36	52	26	80	225	525
1908.....	1	62	39	26	53	154	530
1909.....	1	36	50	17	85	105	427

Mortality in the Sanitary Districts 1885-1909 — Hudson Valley District — (Continued)

YEAR	OTHER CAUSES OF DEATH				
	Con- sumption	Acute respiratory diseases	Puerperal	Digestive	Urinary
1885.....	1,295	1,059	99	496	370
1886.....	1,330	1,167	99	706	370
1887.....	1,331	946	107	642	326
1888.....	1,258	1,230	85	674	415
1889.....	1,454	1,310	83	725	453
1890.....	1,329	747	74	813	528
1891.....	1,343	2,053	81	912	545
1892.....	1,369	2,167	104	867	587
1893.....	1,244	1,827	114	872	600
1894.....	1,305	1,570	90	816	731
1895.....	1,298	1,696	79	823	711
1896.....	1,414	1,574	52	876	715
1897.....	1,316	1,755	78	863	783
1898.....	1,258	1,492	82	827	772
1899.....	1,313	1,541	62	822	756
1900.....	1,373	1,606	75	857	781
1901.....	1,342	1,519	87	968	774
1902.....	1,180	1,279	61	837	811
1903.....	1,259	1,391	73	847	939
1904.....	1,346	1,403	68	959	941
1905.....	1,286	1,401	88	951	948
1906.....	1,126	1,531	81	916	966
1907.....	1,235	1,727	83	859	1,164
1908.....	1,226	1,436	95	838	1,204
1909.....	1,181	1,477	85	906	1,264

Mortality in the Sanitary Districts 1885-1909 — Hudson Valley District — (Concluded)

YEAR	OTHER CAUSES OF DEATH — (Concluded)					
	Circula- tory	Nervous	Cancer	Violence	Old age	Unclass- ified
1885.....	717	1,216	238	333	523	767
1886.....	844	964	232	386	722	798
1887.....	957	955	233	413	1,187	801
1888.....	900	1,152	264	412	1,417	965
1889.....	1,043	1,134	291	425	1,090	815
1890.....	1,002	1,401	292	411	841	833
1891.....	1,045	1,539	300	505	990	957
1892.....	1,069	1,687	330	561	894	1,093
1893.....	1,117	1,577	366	536	853	1,091
1894.....	997	1,512	332	542	796	1,180
1895.....	1,026	1,634	356	476	805	1,184
1896.....	1,119	1,649	404	577	766	1,125
1897.....	1,241	1,632	425	521	765	1,056
1898.....	1,254	1,719	419	578	785	1,025
1899.....	1,251	1,646	415	582	765	1,227
1900.....	1,276	1,668	476	531	731	1,193
1901.....	1,324	1,657	456	657	720	1,186
1902.....	1,458	1,493	497	629	594	1,092
1903.....	1,556	1,509	536	707	586	1,209
1904.....	1,542	1,617	535	660	624	1,510
1905.....	1,506	1,591	549	802	600	1,378
1906.....	1,495	1,524	580	702	523	1,544
1907.....	1,531	1,760	571	780	291	1,720
1908.....	1,507	1,565	609	761	224	1,740
1909.....	1,622	1,541	657	863	*	1,807

* Included with unclassified causes.

*Mortality in the Sanitary Districts 1885-1909 — Adirondack
and Northern District*

YEAR	All deaths	Death rate	Deaths under five years of age	EPIDEMIC DISEASES		
				Cerebro- spinal menin- gitis	Typhoid fever	Malarial diseases
1885	2,428		626	20	47	12
1886	2,479		616	25	51	5
1887	2,969		710	36	71	11
1888	3,435		823	36	63	10
1889	3,129		735	13	72	15
1890	3,825		795	19	51	12
1891	4,131		888	23	81	18
1892	4,534		924	34	89	13
1893	4,367		881	13	89	9
1894	4,435		890	29	100	4
1895	4,263	13.0	904	18	108	4
1896	4,447	13.0	862	29	77	
1897	5,257	14.5	1,011	23	96	6
1898	5,187	14.7	984	27	122	5
1899	5,332	14.0	994	37	139	4
1900	5,430	14.2	1,083	36	152	5
1901	5,611	14.0	1,155	31	97	3
1902	4,981	13.0	937	30	99	5
1903	5,305	13.4	927	26	112	3
1904	5,728	14.5	1,056	27	128	
1905	5,996	15.0	1,266	31	109	3
1906	6,161	15.1	1,251	31	115	6
1907	6,302	15.2	1,254	17	108	6
1908	6,042	14.6	1,216	17	78	1
1909	6,256	15.0	1,315	15	80	3

*Mortality in the Sanitary Districts 1885-1909 — Adirondack
and Northern District — (Continued)*

YEAR	EPIDEMIC DISEASES — (Continued)						
	Small- pox	Scarlet fever	Measles	Erysip- elas	Whoop- ing cough	Diph- theria	Diar- rhea
1885	1	19	11	11	28	175	113
1886		19	18	9	40	110	144
1887		28	16	19	20	147	189
1888	3	39	30	8	8	160	208
1889		9	16	6	34	106	194
1890		12	25	10	32	145	166
1891		23	10	12	12	141	286
1892		23	50	15	23	133	208
1893		43	14	11	41	177	186
1894		25	6	18	31	123	255
1895		29	2	9	22	79	226
1896		24	41	15	16	121	237
1897		6	27	11	28	132	240
1898		3	30	9	43	59	307
1899		19	2	10	44	54	270
1900		23	48	25	24	74	393
1901	4	35	83	22	36	93	229
1902	9	28	25	14	24	46	167
1903	2	22	14	18	18	57	204
1904	1	29	3	15	32	65	131
1905		11	67	11	68	42	258
1906		12	19	22	36	67	209
1907		12	12	15	31	67	224
1908		10	7	18	17	53	271
1909		8	29	18	54	32	245

*Mortality in the Sanitary Districts 1885-1909 — Adirondack
and Northern District — (Continued)*

YEAR	OTHER CAUSES OF DEATH				
	Con- sumption	Acute respiratory diseases	Puerperal	Digestive	Urinary
1885.....	359	268	38	149	84
1886.....	342	220	51	177	93
1887.....	366	236	32	169	79
1888.....	381	371	48	226	78
1889.....	381	330	32	216	117
1890.....	415	554	38	298	130
1891.....	460	478	37	323	171
1892.....	482	603	38	356	174
1893.....	459	561	44	340	197
1894.....	510	504	47	326	225
1895.....	488	459	55	323	195
1896.....	520	453	35	338	248
1897.....	571	672	50	377	321
1898.....	581	551	55	436	304
1899.....	525	693	39	404	319
1900.....	539	616	46	399	318
1901.....	564	703	45	441	322
1902.....	521	459	42	399	311
1903.....	493	515	46	446	342
1904.....	552	545	55	415	351
1905.....	583	614	65	500	376
1906.....	550	689	56	466	380
1907.....	549	790	70	476	494
1908.....	571	645	60	459	450
1909.....	556	794	59	477	477

*Mortality in the Sanitary Districts 1885-1909 — Adirondack
and Northern District — (Concluded)*

YEAR	OTHER CAUSES OF DEATH — (Concluded)					
	Circula- tory	Nervous	Cancer	Violence	Old age	Unclassi- fied
1885.....	209	253	66	89	217	269
1886.....	193	262	92	92	323	212
1887.....	182	253	112	106	626	268
1888.....	221	317	94	102	743	290
1889.....	237	364	110	114	484	289
1890.....	287	370	115	132	454	370
1891.....	388	433	128	177	556	388
1892.....	439	518	133	178	567	458
1893.....	402	508	157	163	523	430
1894.....	435	514	145	165	501	472
1895.....	445	532	173	179	480	437
1896.....	472	561	192	215	432	426
1897.....	594	627	213	241	539	483
1898.....	567	678	212	239	502	462
1899.....	552	669	212	207	586	549
1900.....	573	678	234	231	470	546
1901.....	627	708	208	249	483	628
1902.....	591	681	229	262	469	570
1903.....	676	685	239	270	480	637
1904.....	790	954	255	289	452	839
1905.....	717	682	288	314	486	771
1906.....	791	782	278	346	409	897
1907.....	723	814	272	340	239	1,043
1908.....	760	721	265	365	244	1,030
1909.....	785	801	341	336	*	1,146

* Included with unclassified causes.

Mortality in the Sanitary Districts 1885-1909 — Mohawk Valley District

YEAR	All deaths	Death rate	Deaths under five years of age	EPIDEMIC DISEASES		
				Cerebro-spinal meningitis	Typhoid fever	Malarial diseases
1885	3,174	.....	647	32	62	19
1886	3,559	.....	946	54	78	22
1887	4,359	.....	1,089	33	89	14
1888	4,594	.....	1,106	19	101	19
1889	4,643	.....	1,152	32	99	17
1890	5,178	.....	1,151	32	159	32
1891	5,978	.....	1,310	25	166	23
1892	6,356	.....	1,278	28	178	23
1893	5,497	.....	1,231	19	118	16
1894	5,375	.....	1,286	19	112	13
1895	5,358	15.3	1,133	24	106	7
1896	5,714	16.4	1,300	35	185	6
1897	5,811	16.0	1,025	20	96	5
1898	5,883	15.5	1,185	40	128	3
1899	6,087	15.5	1,060	32	90	3
1900	6,164	15.5	1,375	26	189	5
1901	6,455	16.0	1,195	28	110	4
1902	6,089	15.0	1,252	26	84	1
1903	6,534	15.1	1,358	28	101	1
1904	6,846	16.0	1,389	41	85	.....
1905	6,768	15.4	1,396	73	82	4
1906	7,230	16.3	1,631	43	88	4
1907	7,626	16.6	1,698	19	79	2
1908	7,524	16.3	1,784	25	79	5
1909	7,116	15.2	1,557	25	63	5

Mortality in the Sanitary Districts 1885-1909 — Mohawk Valley District — (Continued)

YEAR	EPIDEMIC DISEASES — (Continued)						
	Small-pox	Scarlet fever	Measles	Erysipelas	Whooping cough	Diphtheria	Diar-rhea
1885	.....	19	36	20	12	142	183
1886	.....	38	.....	13	29	131	192
1887	.....	32	25	8	21	294	321
1888	.....	18	22	9	20	301	283
1889	1	30	26	11	28	249	305
1890	.....	41	21	9	20	273	292
1891	.....	62	26	13	30	188	315
1892	.....	90	33	17	30	290	264
1893	.....	67	22	16	25	209	293
1894	1	64	1	16	38	151	350
1895	.....	25	1	16	36	60	297
1896	.....	23	109	22	49	86	388
1897	.....	13	25	11	21	109	244
1898	.....	10	24	12	30	89	382
1899	1	13	8	12	52	114	256
1900	2	18	67	15	50	132	405
1901	4	25	49	25	37	142	264
1902	2	77	16	11	10	121	264
1903	2	60	17	18	79	97	280
1904	.....	78	16	15	36	108	268
1905	.....	38	34	16	24	67	276
1906	1	50	10	25	54	106	322
1907	.....	36	34	27	46	80	357
1908	1	55	16	25	53	73	396
1909	.....	47	12	21	33	53	357

Mortality in the Sanitary Districts 1885-1909 — Mohawk Valley District — (Continued)

YEAR	OTHER CAUSES OF DEATH				
	Con- sumption	Acute respiratory diseases	Puerperal	Digestive	Urinary
1885	456	366	41	185	111
1886	471	359	30	286	146
1887	485	364	33	274	156
1888	530	469	43	265	167
1889	527	477	30	303	189
1890	582	693	41	403	228
1891	646	813	44	445	297
1892	661	909	50	443	294
1893	564	702	40	403	323
1894	602	596	34	430	303
1895	608	607	45	389	360
1896	596	655	42	422	340
1897	533	759	62	432	359
1898	606	591	43	427	408
1899	549	807	45	468	431
1900	559	713	46	479	386
1901	608	887	48	512	438
1902	517	631	38	506	426
1903	570	673	49	497	488
1904	579	756	58	550	467
1905	588	778	47	511	488
1906	523	856	62	598	569
1907	604	987	60	558	721
1908	612	898	80	546	708
1909	585	842	69	498	730

Mortality in the Sanitary Districts 1885-1909 — Mohawk Valley District — (Concluded)

YEAR	OTHER CAUSES OF DEATH — (Concluded)					
	Circula- tory	Nervous	Cancer	Violence	Old age	Unclassi- fied
1885	263	452	99	115	293	268
1886	266	426	115	143	460	300
1887	319	474	165	173	712	367
1888	330	473	166	212	768	385
1889	436	549	180	187	631	412
1890	414	694	154	209	691	400
1891	524	771	194	230	694	438
1892	575	850	209	257	699	458
1893	523	728	200	237	527	465
1894	462	729	176	254	500	525
1895	529	715	207	228	536	557
1896	551	720	189	273	502	574
1897	570	789	243	277	541	503
1898	617	828	264	305	482	541
1899	691	802	255	284	555	824
1900	625	798	295	331	453	620
1901	677	828	267	340	473	689
1902	703	859	282	401	440	668
1903	775	911	276	371	408	773
1904	817	878	314	433	481	866
1905	844	826	331	396	496	846
1906	893	924	310	441	399	952
1907	861	975	352	469	211	1,138
1908	902	961	336	455	204	1,097
1909	883	877	397	433	*	1,186

* Included with unclassified causes.

Mortality in the Sanitary Districts 1885-1909 — Southern Tier District

YEAR	All deaths	Death rate	Deaths under five years of age	EPIDEMIC DISEASES		
				Cerebro-spinal meningitis	Typhoid fever	Malarial diseases
1885	1,741		404	10	41	21
1886	1,852		442	10	49	25
1887	2,513		580	19	76	33
1888	3,276		700	23	93	42
1889	3,390		684	20	115	24
1890	3,854		786	23	91	22
1891	4,648		839	22	132	10
1892	4,934		880	24	107	7
1893	4,838		940	28	105	8
1894	4,862		953	27	126	12
1895	4,780	12.0	930	18	118	13
1896	4,754	13.0	678	18	152	9
1897	5,523	14.0	811	8	75	11
1898	5,462	14.0	891	16	112	18
1899	5,930	14.0	860	30	121	3
1900	5,918	14.0	1,003	21	141	10
1901	5,982	14.0	951	21	107	8
1902	5,811	14.0	957	19	101	6
1903	5,966	13.9	943	17	111	5
1904	6,792	15.5	1,032	19	93	7
1905	6,425	14.5	1,003	27	77	3
1906	6,443	14.7	1,137	25	124	7
1907	6,909	15.6	1,101	22	90	9
1908	6,959	15.6	1,159	22	90	2
1909	6,977	15.5	1,065	18	101	6

Mortality in the Sanitary Districts 1885-1909 — Southern Tier District — (Continued)

YEAR	EPIDEMIC DISEASES — (Continued)						
	Small pox	Scarlet fever	Measles	Erysipelas	Whooping cough	Diphtheria	Diar-rhea
1885		20	18	14	14	48	97
1886		10	5	13	10	76	111
1887		24	6	11	8	111	178
1888		34	32	9	13	112	177
1889	1	34	10	7	22	117	196
1890		30	35	8	58	136	207
1891	1	34	32	7	12	195	248
1892		46	14	13	25	248	207
1893		68	51	17	19	294	241
1894	2	32	6	15	55	192	281
1895		7	13	18	33	99	242
1896		11	14	12	10	74	239
1897		13	27	16	51	91	204
1898		15	36	11	35	72	327
1899		28	11	6	39	75	225
1900		28	34	14	42	115	323
1901		19	33	19	67	80	170
1902	6	30	29	23	20	121	198
1903		29	13	14	60	75	178
1904	1	59	58	22	21	103	152
1905		18	9	29	36	71	184
1906		9	4	16	52	61	241
1907		22	28	13	23	88	174
1908		14	17	12	53	63	235
1909		22	20	25	27	71	152

Mortality in the Sanitary Districts 1885-1909 — Southern Tier District — (Continued)

YEAR	OTHER CAUSES OF DEATH				
	Con- sumption	Acute respiratory diseases	Puerperal	Digestive	Urinary
1885.....	199	195	31	132	51
1886.....	187	180	27	141	58
1887.....	236	233	31	175	57
1888.....	330	384	31	229	117
1889.....	300	361	35	254	128
1890.....	345	539	42	292	131
1891.....	412	651	36	377	177
1892.....	438	743	50	391	229
1893.....	372	584	52	376	239
1894.....	394	547	53	427	241
1895.....	413	606	36	370	274
1896.....	411	501	37	438	291
1897.....	390	624	66	452	339
1898.....	401	548	45	444	366
1899.....	485	699	45	506	374
1900.....	452	648	52	448	414
1901.....	441	716	35	499	423
1902.....	431	574	49	510	407
1903.....	378	569	53	496	387
1904.....	459	720	54	570	477
1905.....	431	675	50	544	441
1906.....	395	647	49	508	501
1907.....	400	822	68	547	657
1908.....	419	765	54	585	696
1909.....	362	792	63	587	697

Mortality in the Sanitary Districts 1885-1909 — Southern Tier District — (Concluded)

YEAR	OTHER CAUSES OF DEATH — (Concluded)					
	Circula- tory	Nervous	Cancer	Violence	Old age	Unclassi- fied
1885.....	145	253	68	86	135	163
1886.....	151	233	83	86	207	190
1887.....	169	292	74	140	416	225
1888.....	230	317	112	166	530	277
1889.....	282	416	120	147	436	355
1890.....	323	451	139	239	444	299
1891.....	415	566	151	233	549	378
1892.....	484	565	172	251	548	372
1893.....	472	594	164	250	513	391
1894.....	452	586	191	235	500	485
1895.....	485	574	182	251	559	452
1896.....	543	618	217	275	503	391
1897.....	623	694	260	332	533	427
1898.....	643	780	263	332	546	462
1899.....	737	792	280	295	631	548
1900.....	683	794	287	308	544	560
1901.....	673	838	261	368	550	654
1902.....	757	830	259	350	512	549
1902.....	902	784	309	385	509	692
1904.....	939	906	338	446	550	798
1905.....	905	844	342	439	521	779
1906.....	935	874	331	383	430	851
1907.....	944	939	349	438	227	1,049
1908.....	931	916	388	437	223	1,037
1909.....	1,023	919	412	467	*	1,213

* Included with unclassified causes.

Mortality in the Sanitary Districts 1885-1909 — East Central District

YEAR	All deaths	Death rate	Deaths under five years of age	EPIDEMIC DISEASES		
				Cerebro-spinal meningitis	Typhoid fever	Malarial diseases
1885	2,444		537	26	48	21
1886	2,947		610	20	81	19
1887	3,465		765	12	71	40
1888	4,222		949	22	121	37
1889	4,290		921	23	103	39
1890	4,918		973	24	91	25
1891	5,113		1,066	28	135	24
1892	5,467		1,054	29	78	25
1893	5,493		1,114	21	100	17
1894	5,224		1,060	22	116	10
1895	5,422	15.5	1,087	24	107	17
1896	5,371	15.4	1,070	27	96	12
1897	5,758	16.0	1,042	30	70	8
1898	5,745	16.0	1,019	15	123	14
1899	5,687	14.0	758	22	107	5
1900	5,796	14.0	1,028	22	110	10
1901	5,801	14.5	894	21	104	4
1902	5,481	14.0	852	20	72	1
1903	5,781	14.3	878	12	70	1
1904	5,422	16.0	961	30	80	2
1905	5,464	15.5	1,082	48	70	9
1906	5,371	15.4	1,124	23	59	1
1907	5,689	15.9	1,085	16	79	2
1908	5,879	16.3	1,185	17	72	5
1909	5,619	15.5	1,134	9	68	.....

Mortality in the Sanitary Districts 1885-1909 — East Central District — (Continued)

YEAR	EPIDEMIC DISEASES — (Continued)						
	Small-pox	Scarlet fever	Measles	Erysipelas	Whooping cough	Diphtheria	Diar-rhea
1885	1	10	14	11	8	80	146
1886	1	8	5	26	8	119	151
1887		17	17	12	28	106	196
1888	1	39	53	13	16	182	307
1889	15	52	16	11	21	145	346
1890		24	36	4	34	112	281
1891		25	19	14	17	89	350
1892	1	26	14	27	22	172	254
1893		26	71	17	34	257	264
1894	1	23	1	17	28	160	334
1895		33	4	15	25	71	292
1896		40	17	11	15	111	336
1897		21	62	12	39	126	222
1898		22	35	13	21	91	309
1899		14	5	13	38	47	195
1900		19	47	22	38	61	395
1901	2	27	75	14	29	64	181
1902		9	10	13	30	44	182
1903		14	30	10	50	50	160
1904		38	24	20	10	59	135
1905		57	24	20	17	36	207
1906		26	19	10	56	44	229
1907		20	6	16	9	64	249
1908		12	28	13	32	46	284
1909		29	4	17	58	43	234

Mortality in the Sanitary Districts 1885-1909 — East Central District — (Continued)

YEAR	OTHER CAUSES OF DEATH				
	Con- sumption	Acute respiratory diseases	Puerperal	Digestive	Urinary
1885.....	342	286	22	149	86
1886.....	388	321	46	209	101
1887.....	410	324	47	193	123
1888.....	467	391	68	237	138
1889.....	476	434	69	267	176
1890.....	533	732	44	344	197
1891.....	546	612	38	380	275
1892.....	536	780	42	429	256
1893.....	537	733	48	418	268
1894.....	565	555	80	406	278
1895.....	534	655	31	416	316
1896.....	502	579	40	428	309
1897.....	557	708	51	464	345
1898.....	519	615	36	461	361
1899.....	485	744	41	464	352
1900.....	513	583	34	470	378
1901.....	563	649	49	467	360
1902.....	482	514	51	478	415
1903.....	479	626	45	458	414
1904.....	567	734	38	482	459
1905.....	576	664	42	471	488
1906.....	491	656	34	464	489
1907.....	526	797	49	477	596
1908.....	525	669	54	552	637
1909.....	512	748	55	474	626

Mortality in the Sanitary Districts 1885-1909 — East Central District — (Concluded)

YEAR	OTHER CAUSES OF DEATH — (Concluded)					
	Circula- tory	Nervous	Cancer	Violence	Old age	Unclassi- fied
1885.....	197	291	89	104	212	301
1886.....	251	335	110	139	387	224
1887.....	274	376	107	166	730	216
1888.....	348	446	152	178	762	254
1889.....	377	497	158	150	660	244
1890.....	454	503	178	227	575	496
1891.....	431	616	172	214	717	412
1892.....	558	686	195	248	668	441
1893.....	551	662	192	243	587	445
1894.....	503	649	233	244	539	490
1895.....	593	682	255	294	537	552
1896.....	640	690	258	266	503	495
1897.....	738	757	268	280	538	468
1898.....	707	761	305	310	536	491
1899.....	719	763	310	275	581	507
1900.....	720	760	329	276	474	535
1901.....	798	765	295	261	528	555
1902.....	786	783	306	287	441	560
1903.....	885	773	314	322	468	600
1904.....	900	843	325	345	535	798
1905.....	970	863	335	352	499	716
1906.....	938	831	343	388	438	832
1907.....	887	839	337	426	200	894
1908.....	940	938	351	426	201	1,047
1909.....	969	825	383	407	*.....	1,158

* Included with unclassified clauses.

Mortality in the Sanitary Districts 1885-1909 — West Central District

YEAR	All deaths	Death rate	Deaths under five years of age	EPIDEMIC DISEASES		
				Cerebro-spinal, meningitis	Typhoid fever	Malarial diseases
1885.....	1,812	.....	306	15	45	24
1886.....	2,056	.....	383	14	42	22
1887.....	2,474	.....	457	8	47	24
1888.....	2,950	.....	412	24	51	20
1889.....	2,918	.....	459	14	58	24
1890.....	3,660	.....	602	15	64	17
1891.....	4,040	.....	519	18	72	11
1892.....	4,349	.....	556	20	61	18
1893.....	3,865	.....	600	12	61	14
1894.....	3,868	.....	562	17	65	16
1895.....	4,019	13.4	573	13	82	13
1896.....	4,086	13.0	638	9	54	20
1897.....	4,351	14.5	560	21	45	14
1898.....	4,243	14.3	610	9	39	11
1899.....	4,565	14.0	568	25	50	8
1900.....	4,461	14.0	654	13	91	5
1901.....	4,577	14.3	624	10	60	6
1902.....	4,448	14.0	593	12	50	8
1903.....	4,822	15.0	608	6	116	5
1904.....	4,970	15.5	620	13	65	6
1905.....	5,073	16.0	712	18	57	4
1906.....	4,917	15.6	722	18	62	4
1907.....	5,209	16.6	691	20	45	3
1908.....	4,849	15.3	672	17	62	3
1909.....	4,856	15.2	656	2	44	3

Mortality in the Sanitary Districts 1885-1909 — West Central District — (Continued)

YEAR	EPIDEMIC DISEASES — (Continued)						
	Small-pox	Scarlet fever	Measles	Erysipelas	Whooping cough	Diphtheria	Diarrhea
1885.....	.....	3	3	12	7	41	90
1886.....	.....	5	1	6	15	42	112
1887.....	.....	.....	4	12	11	76	144
1888.....	2	27	11	8	2	69	112
1889.....	4	23	4	7	11	79	136
1890.....	1	24	55	9	28	60	163
1891.....	2	30	10	11	15	36	153
1892.....	.....	23	8	19	22	84	124
1893.....	.....	32	14	12	19	167	146
1894.....	1	23	3	12	12	62	158
1895.....	.....	8	5	14	18	56	179
1896.....	.....	21	20	11	20	39	217
1897.....	.....	9	14	14	18	59	137
1898.....	.....	7	10	7	23	24	219
1899.....	.....	21	9	9	7	60	159
1900.....	.....	15	24	6	27	70	253
1901.....	.....	10	29	12	46	28	128
1902.....	6	5	3	15	23	33	156
1903.....	.....	6	15	20	16	40	128
1904.....	.....	7	13	22	7	48	130
1905.....	.....	9	22	12	28	37	175
1906.....	.....	9	13	7	23	27	179
1907.....	.....	15	12	20	27	47	118
1908.....	.....	11	9	11	15	35	147
1909.....	.....	11	5	16	20	25	128

Mortality in the Sanitary Districts 1885-1909 — West Central District — (Continued)

YEAR	OTHER CAUSES OF DEATH				
	Con- sumption	Acute respiratory diseases	Puerperal	Digestive	Urinary
1885.....	281	196	22	138	85
1886.....	290	178	24	115	94
1887.....	285	192	23	149	94
1888.....	330	234	28	185	102
1889.....	322	293	18	200	137
1890.....	391	466	21	291	200
1891.....	428	443	32	312	204
1892.....	441	599	40	333	197
1893.....	409	418	35	309	203
1894.....	459	370	25	313	336
1895.....	398	468	27	350	255
1896.....	375	379	30	337	268
1897.....	392	507	48	359	289
1898.....	384	421	33	373	322
1899.....	395	567	23	355	246
1900.....	375	418	28	346	285
1901.....	363	526	32	364	305
1902.....	341	430	30	351	288
1903.....	355	491	30	379	300
1904.....	357	513	33	378	352
1905.....	352	477	30	419	362
1906.....	315	494	38	399	318
1907.....	357	584	43	403	452
1908.....	340	452	44	395	432
1909.....	335	530	34	374	467

Mortality in the Sanitary Districts 1885-1909 — West Central District — (Concluded)

YEAR	OTHER CAUSES OF DEATH — (Concluded)					
	Circula- tory	Nervous	Cancer	Violence	Old age	Unclassi- fied
1885.....	167	275	58	80	218	152
1886.....	151	295	72	93	306	179
1887.....	162	256	94	101	594	198
1888.....	223	339	87	118	749	229
1889.....	255	366	104	146	510	227
1890.....	361	440	144	153	509	250
1891.....	430	529	169	184	639	362
1892.....	499	612	171	193	364	287
1893.....	386	511	166	187	457	317
1894.....	466	537	153	166	448	326
1895.....	461	520	162	160	495	337
1896.....	510	642	177	182	430	345
1897.....	563	677	199	234	411	311
1898.....	530	635	218	216	421	341
1899.....	635	697	213	211	486	389
1900.....	594	658	232	224	415	382
1901.....	625	711	227	235	416	444
1902.....	710	678	246	251	399	413
1903.....	727	732	276	293	420	467
1904.....	758	787	250	296	438	527
1905.....	726	760	291	294	466	534
1906.....	752	729	276	313	357	584
1907.....	697	821	288	330	208	719
1908.....	645	700	295	311	197	728
1909.....	679	695	296	320	*	872

* Included with unclassified causes.

*Mortality in the Sanitary Districts 1885-1909 — Lake Ontario
and Western District*

YEAR	All deaths	Death rate	Deaths under five years of age	EPIDEMIC DISEASES		
				Cerebro- spinal menin- gitis	Typhoid fever	Malarial diseases
1885.....	4,745	.....	1,258	24	99	31
1886.....	7,448	.....	2,029	70	133	63
1887.....	9,065	.....	3,370	65	175	70
1888.....	10,530	.....	3,887	72	243	86
1889.....	9,726	.....	3,397	81	208	63
1890.....	11,120	.....	3,860	107	250	89
1891.....	12,938	.....	4,270	91	306	67
1892.....	11,820	.....	4,331	71	269	55
1893.....	12,649	.....	4,242	60	267	27
1894.....	11,721	.....	3,941	50	295	16
1895.....	11,519	15.5	3,534	47	227	24
1896.....	11,103	15.0	3,367	49	188	19
1897.....	11,368	15.3	3,021	51	187	15
1898.....	11,446	15.4	2,842	92	224	18
1899.....	11,981	13.7	2,867	58	201	7
1900.....	12,278	14.0	3,240	48	205	9
1901.....	12,875	15.0	2,983	81	250	4
1902.....	12,292	14.0	2,930	50	252	5
1903.....	13,498	15.0	3,120	60	280	3
1904.....	13,921	15.5	3,171	73	229	9
1905.....	14,254	15.2	3,844	101	239	5
1906.....	14,649	15.5	3,614	124	247	6
1907.....	15,627	16.0	4,072	61	265	3
1908.....	14,638	15.0	3,667	35	224	1
1909.....	15,134	15.0	3,888	30	200	2

*Mortality in the Sanitary Districts 1885-1909 — Lake Ontario
and Western District — (Continued)*

YEAR	EPIDEMIC DISEASES — (Continued)						
	Small- pox	Scarlet fever	Measles	Erysip- elas	Whoop- ing cough	Diph- theria	Diar- rhea
1885.....	.....	53	31	31	22	235	285
1886.....	.....	74	6	36	41	434	598
1887.....	.....	124	100	23	35	528	1,018
1888.....	46	123	69	32	30	538	1,047
1889.....	9	68	19	24	126	348	840
1890.....	.....	64	109	20	43	363	844
1891.....	.....	126	79	35	54	556	961
1892.....	.....	171	25	38	112	675	923
1893.....	.....	238	38	39	74	499	1,238
1894.....	2	115	26	33	114	472	1,217
1895.....	.....	38	123	26	72	454	1,041
1896.....	.....	43	53	22	86	437	1,055
1897.....	.....	44	66	24	110	390	865
1898.....	.....	27	7	16	97	179	956
1899.....	1	59	73	32	66	197	845
1900.....	1	66	116	25	103	202	1,055
1901.....	3	57	65	38	123	238	780
1902.....	53	48	89	31	67	208	694
1903.....	29	82	77	39	108	318	681
1904.....	2	71	46	49	35	306	740
1905.....	.....	65	161	35	127	253	722
1906.....	.....	54	64	32	90	243	841
1907.....	1	65	108	51	122	187	712
1908.....	.....	139	52	55	74	190	762
1909.....	.....	227	119	28	67	177	732

*Mortality in the Sanitary Districts 1885-1909 — Lake Ontario
and Western District — (Continued)*

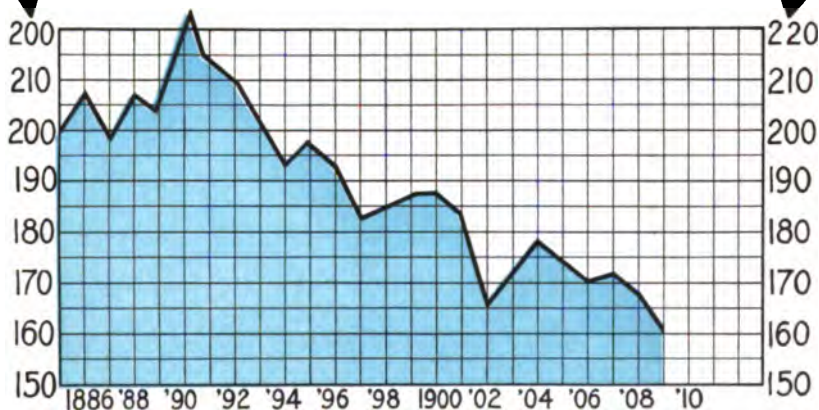
YEAR	OTHER CAUSES OF DEATH				
	Con- sumption	Acute respiratory diseases	Puerperal	Digestive	Urinary
1885.....	617	460	73	280	189
1886.....	937	707	55	441	226
1887.....	950	750	52	540	267
1888.....	1,091	1,033	116	687	320
1889.....	1,016	1,029	107	670	341
1890.....	1,180	1,623	80	889	389
1891.....	1,347	1,989	119	1,000	560
1892.....	1,281	1,839	91	986	505
1893.....	1,179	1,510	121	1,017	542
1894.....	1,204	1,324	90	769	521
1895.....	1,209	1,552	113	758	583
1896.....	1,133	1,355	105	742	680
1897.....	1,075	1,482	122	792	693
1898.....	1,038	1,394	103	814	749
1899.....	1,114	1,623	93	837	773
1900.....	1,129	1,408	111	841	824
1901.....	1,155	1,579	116	967	765
1902.....	1,030	1,301	101	913	805
1903.....	1,078	1,454	126	1,046	873
1904.....	1,175	1,596	118	1,041	842
1905.....	1,152	1,475	180	954	974
1906.....	1,086	1,611	182	1,067	1,027
1907.....	1,145	1,923	200	1,259	1,149
1908.....	1,137	1,549	187	917	1,012
1909.....	1,213	1,959	198	1,106	1,133

*Mortality in the Sanitary Districts 1885-1909 — Lake Ontario
and Western District — (Concluded)*

YEAR	OTHER CAUSES OF DEATH — (Concluded)					
	Circula- tory	Nervous	Cancer	Violence	Old age	Unclassi- fied
1885.....	337	658	177	198	390	555
1886.....	448	1,047	204	304	579	1,005
1887.....	479	1,249	259	389	975	1,017
1888.....	666	1,397	275	528	848	1,283
1889.....	688	1,285	307	503	778	1,336
1890.....	696	1,417	313	564	653	1,419
1891.....	868	1,698	392	696	816	1,634
1892.....	905	1,618	333	630	824	1,449
1893.....	982	1,698	393	649	823	1,265
1894.....	959	1,565	425	595	785	1,144
1895.....	1,014	1,487	414	547	788	1,001
1896.....	1,078	1,465	459	569	762	893
1897.....	1,116	1,509	495	615	835	882
1898.....	1,173	1,549	530	634	830	1,017
1899.....	1,231	1,553	548	600	870	1,198
1900.....	1,274	1,588	569	663	859	1,186
1901.....	1,337	1,618	665	820	814	1,400
1902.....	1,412	1,670	624	807	787	1,315
1903.....	1,595	1,797	678	893	809	1,472
1904.....	1,681	1,756	713	839	853	1,747
1905.....	1,720	1,672	768	943	871	1,848
1906.....	1,800	1,695	763	1,087	692	1,928
1907.....	1,759	1,744	717	1,113	561	2,482
1908.....	1,610	1,457	746	924	477	3,090
1909.....	1,952	1,762	733	1,111	*	2,385

* Included with unclassified causes.

MORTALITY FROM PULMONARY TUBERCULOSIS. DEATHS PER 100,000 POPULATION SINCE 1885.



NEW YORK STATE DEPARTMENT OF HEALTH



Mortality from Pulmonary Tuberculosis

The following table shows the total deaths in the State, annual death rate per 1,000 population; reported mortality from tuberculosis, and deaths per 100,000 population, due to tuberculosis since 1885; also percentage of deaths due to tuberculosis.

YEAR	Population	Total deaths	Death rate	Deaths from tuberculosis	Deaths per 100,000 population	Percentage of all deaths due to tuberculosis
1885.....	5,609,910	80,407	14.3	11,238	200.3	14.0
1886.....	5,719,855	86,801	15.2	11,947	208.8	13.7
1887.....	5,831,947	108,269	18.6	11,609	199.0	10.7
1888.....	5,946,246	114,584	19.3	12,383	208.2	10.8
1889.....	6,062,764	113,155	18.6	12,390	204.3	10.9
1890.....	6,182,600	128,648	20.8	13,831	223.7	10.8
1891.....	6,316,333	129,850	20.5	13,445	212.8	10.4
1892.....	6,438,283	131,388	20.3	13,471	209.2	10.3
1893.....	6,537,716	129,659	19.7	13,123	200.7	10.2
1894.....	6,638,696	123,423	18.6	12,824	193.1	10.5
1895.....	6,741,246	128,834	19.1	13,267	196.7	10.5
1896.....	6,845,375	126,253	18.4	13,265	193.7	10.7
1897.....	6,951,111	118,525	17.1	12,641	181.8	10.8
1898.....	7,058,459	122,584	17.4	12,978	183.8	10.7
1899.....	7,167,491	121,831	17.0	13,412	187.1	11.0
1900.....	7,281,533	132,352	18.2	13,590	186.6	10.6
1901.....	7,434,896	131,461	17.7	13,766	185.1	10.6
1902.....	7,591,491	124,657	16.4	12,582	165.7	10.2
1903.....	7,751,375	127,602	16.4	13,194	170.2	10.4
1904.....	7,914,636	142,014	17.8	14,159	178.8	10.0
1905.....	8,081,333	137,222	17.0	14,064	174.0	10.3
1906.....	8,251,538	140,773	17.1	14,026	170.0	10.0
1907.....	8,425,333	147,890	17.5	14,431	171.0	9.8
1908.....	8,546,356	138,912	16.3	14,347	167.5	10.3
1909.....	8,699,643	140,261	16.1	13,996	161.0	10.0

Mortality from Pulmonary Tuberculosis

In the entire State there were 13,996 deaths from tuberculosis of the respiratory organs during 1909, a moderate decrease from the number in the five years preceding. The mortalities of the State for quinquennial periods since 1885 have been:

	Yearly average	Percentage of all death
1885-89.....	11,913	12.6
1890-94.....	13,339	11.0
1895-99.....	13,313	10.9
1900-04.....	13,458	10.4
1905-09.....	14,557	10.1

In 1907 the death rate from pulmonary tuberculosis was 171.0 per 100,000 population; in 1908 the rate was 167.5; in 1909 the rate was 161.0.

The actual mortality for the past twenty-five years has gradually increased for that period from about 12,000 deaths to about 14,000 deaths yearly, but the increase has been less than the increase in population, which has risen in that period from about five and one-half million to eight and one-half million.

For example, in 1889, when the population was about 6,000,000, there were 12,390 deaths from tuberculosis of the lungs, making a rate of mortality of 204.0 per 100,000 population; if in 1909 there had been the same rate of mortality from this cause there would have been 17,500 deaths from this cause instead of about 14,000. If there had been no increase in population the mortality rate would have been 232 per 100,000 population this year. Deductions from population must, however, doubtless take into account that increase of population is in a considerable degree from outside and perhaps of healthy material.

It is likewise true, as shown, that the ratio of mortality from tuberculosis to mortality from all causes has decreased, having fallen from 12½ per cent. to about 10 per cent. in the course of twenty-five years. The decrease has been constant, each succeeding quinquennial period showing a lower ratio. The total mortality has rather steadily risen from about 100,000 yearly in the first period to about 140,000 in the last.

In the table is shown the rate of mortality in the cities of the State. This also shows a decrease. In the five-year period, 1901-5, the average urban mortality from pulmonary tuberculosis was 203.5 per 100,000 population; in 1906 this rate was 194.1; in 1907 it was 190; in 1908 it was 185; and in 1909 it was 175.7. The decrease has been here likewise constant. It is to be noted, however, that in this urban portion of the State, the estimated number of inhabitants has been greatly increasing. New York city in 1900 had a population of three and one-half million and is now nearly four and one-half million. But while this is true, it is also true that while the actual yearly mortality in New York city for pulmonary tuberculosis for the five-year period, 1901-5, was 8,156, with a constant increase yearly until

in 1907 it amounted to 9,000 deaths, in 1908 it decreased to 8,867, and in 1909 to 8,645; for two years there has been an actual as well as a very considerable relative decrease in the number of deaths from pulmonary tuberculosis. This is less true of most of the smaller cities, but is to a degree true as to a good number of them as is seen by a reference to the table.

In the rural part of the State, while the rate of tuberculosis mortality increased in 1908 to 123.0 per 100,000 population from 112.7 in 1907, it is in 1909 reduced to 119.0, the actual mortality for the three years being 2,913 in 1907, 2,906 in 1908, and 2,783 in 1909.

The mortality from pulmonary tuberculosis in the cities has been:

	Cities	Rest of State
1901-05 (yearly average)	10,646	2,906
1906	11,340	2,687
1907	11,471	2,960
1908	11,324	2,992
1909	11,067	2,881

The sanitary districts give an instructive record, taking into account the civil condition of each of them. All of them show a lower rate of mortality except the Lake Ontario and Western. The Southern Tier district, not only for the series of years presented in the table, but as a uniform fact, has the lowest tuberculosis mortality in the State.

Reported Mortality from Pulmonary Tuberculosis in the Sanitary Districts for past 10 years

DISTRICTS	1900	1901	1902	1903	1904	1905	1906	1907	1908	1909
Metropolitan	6,550	9,730	9,090	8,502	9,124	9,096	9,507	9,590	9,517	9,252
Hudson Valley	1,273	1,342	1,140	1,259	1,347	1,262	1,127	1,235	1,228	1,151
Adirondack and Northern	539	564	521	493	552	563	557	549	571	556
Western Valley	559	606	517	571	579	568	523	494	612	585
Saratoga and Albany	432	441	431	275	459	417	368	409	419	362
East Central	513	563	482	479	507	517	491	529	525	512
West Central	275	300	241	355	357	350	373	357	346	335
Lake Ontario and Western	1,129	1,155	1,040	1,075	1,175	1,132	1,090	1,145	1,127	1,213
Entire State	13,560	13,766	12,562	13,194	14,159	14,064	14,026	14,431	14,347	13,906

* Includes twenty-five delayed returns not classified by district in which they occurred.

The following table gives the number of deaths per 100,000 population from Pulmonary Tuberculosis in the Sanitary Districts in the State during the past 10 years

DISTRICTS	1900	1901	1902	1903	1904	1905	1906	1907	1908	1909
Metropolitan	230.4	224.9	201.5	207.4	213.5	207.0	210.5	204.6	204.6	199.6
Hudson Valley	196.9	193.7	169.9	180.2	196.1	192.5	159.7	173.5	172.1	161.8
Adirondack and Northern	139.5	141.9	130.2	122.4	139.1	142.5	134.0	132.9	137.7	132.5
Western Valley	139.6	146.1	122.1	132.4	132.3	132.2	115.7	131.1	122.7	125.3
Saratoga and Albany	165.5	162.4	99.6	86.9	105.0	99.1	89.0	90.3	93.7	80.4
East Central	127.9	139.4	118.6	117.1	137.7	139.0	118.1	125.5	124.7	120.2
West Central	115.6	114.9	107.9	121.4	113.1	111.5	99.1	113.6	106.7	104.6
Lake Ontario and Western	128.5	129.6	113.5	117.2	125.5	121.5	113.3	117.1	116.3	120.5
Entire State	156.6	155.1	165.7	170.2	178.8	174.0	170.0	171.0	167.5	161.0

In each 1,000 Deaths there were from Tuberculosis in the —

DISTRICTS	1900	1901	1902	1903	1904	1905	1906	1907	1908	1909
Metropolitan	114	115	110	117	110	113	115	111	119	114
Hudson Valley	110	113	107	100	108	104	93	95	100	96
Adirondack and Northern	100	110	105	92	96	97	89	87	95	89
Western Valley	90	93	85	90	85	87	73	79	81	82
Saratoga and Albany	76	75	75	65	68	67	61	57	60	52
East Central	90	96	90	80	87	90	77	78	76	77
West Central	84	90	77	75	71	70	64	68	70	69
Lake Ontario and Western	92	90	85	80	85	82	74	73	77	80
Entire State	106	106	102	104	100	103	100	96	103	100

The following table shows the mortality from Pulmonary Tuberculosis in the cities of the State grouped in order of population

CITIES	1901-1905		1906			1907		
	Deaths per 100,000 population from tuberculosis	Percentage of total deaths from tuberculosis	Total deaths from tuberculosis	Deaths per 100,000 population from tuberculosis	Percentage of total deaths from tuberculosis	Total deaths from tuberculosis	Deaths per 100,000 population from tuberculosis	Percentage of total deaths from tuberculosis
New York.....	215.8	11.6	8,976	218.2	11.8	8,996	212.0	11.4
Buffalo.....	132.0	8.7	496	129.9	7.7	496	128.5	8.1
<i>Cities 100,000 to 200,000 population:</i>								
Rochester.....	126.2	9.5	251	135.2	8.8	239	126.5	8.1
Syracuse.....	135.2	9.4	138	116.2	7.5	148	122.3	7.7
Albany.....	228.0	12.6	203	206.1	11.5	177	177.0	9.8
<i>Cities 50,000 to 100,000 population:</i>								
Troy.....	276.5	13.6	207	270.6	13.4	214	275.8	13.2
Schenectady.....	141.7	9.3	72	116.3	7.9	81	117.4	7.9
Yonkers.....	188.2	11.6	103	160.9	9.4	85	126.9	8.0
Utica.....	174.7	9.6	85	130.8	6.9	122	186.3	9.7
<i>Cities 20,000 to 50,000 population:</i>								
Binghamton.....	139.0	8.1	53	121.3	8.1	44	100.5	6.5
Elmira.....	134.0	8.7	47	131.7	9.1	46	128.9	8.2
Auburn.....	143.3	9.1	52	158.1	9.5	41	124.6	7.7
Niagara Falls.....	99.8	6.2	20	71.9	4.6	26	89.7	4.9
Jamestown.....	93.0	9.0	22	82.7	8.0	19	70.4	6.1
Newburgh.....	261.4	11.9	51	192.5	9.7	65	240.7	12.3
Watertown.....	95.6	6.4	23	88.8	5.0	34	126.4	6.7
Mount Vernon.....	115.1	8.1	26	101.6	6.5	30	113.2	7.5
Kingston.....	209.0	11.0	47	184.3	9.9	48	185.3	10.0
Poughkeepsie.....	174.2	8.8	34	136.0	7.7	29	112.0	5.5
Amsterdam.....	149.5	9.5	31	129.2	7.4	26	104.0	6.2
Coboes.....	229.8	11.3	56	233.3	11.9	61	254.2	12.0
New Rochelle.....	94.9	7.0	25	116.3	7.3	15	66.1	4.4
Oswego.....	150.0	9.4	39	177.3	10.3	27	118.9	7.5
<i>Cities 15,000 to 20,000 population:</i>								
Gloversville.....	107.9	7.8	20	107.5	7.2	12	63.8	3.9
Rome.....	171.7	10.0	13	73.4	4.3	33	186.4	9.7
Lockport.....	135.8	8.7	16	91.4	6.6	22	122.9	8.0
Dunkirk.....	81.4	5.1	16	100.6	6.3	20	119.8	7.5
Middletown.....	202.5	10.0	17	106.9	7.1	25	157.2	10.4
Ithaca.....	129.7	8.4	10	68.0	4.7	19	126.7	7.7
<i>Cities 10,000 to 15,000 population:</i>								
Opdensburg.....	331.7	12.5	21	141.9	7.8	20	135.1	7.6
Watervliet.....	177.6	10.6	25	172.4	10.1	26	176.9	10.2
Corning.....	119.7	8.2	11	79.1	5.9	10	71.4	3.7
Hornell.....	116.3	8.0	16	123.1	8.5	13	100.0	7.1
Geneva.....	83.7	5.9	13	104.0	6.4	16	124.0	8.9
Cortland.....	73.6	6.0	10	87.0	6.6	11	91.7	7.1
Rensselaer.....	148.6	8.6	10	93.4	6.2	12	100.0	7.0
Little Falls.....	105.3	9.2	14	127.3	9.2	17	154.5	9.4
Plattsburg.....	171.0	11.3	6	60.0	4.6	13	120.4	9.4
Hudson.....	184.3	9.7	14	133.3	6.9	21	200.0	10.6
North Tonawanda.....	92.6	7.6	6	60.0	4.3	8	76.2	5.8
Olean.....	54.9	4.8	7	70.0	5.0	9	90.0	6.5
<i>Cities below 10,000 population:</i>								
Port Jervis.....	173.4	10.0	9	92.8	5.1	11	111.1	6.3
Johnstown.....	104.9	7.9	13	135.4	10.9	12	122.5	8.1
Fulton.....	121.3	8.3	1	11.4	7.3	7	77.8	6.0
Oneida.....	126.2	8.9	6	71.4	4.6	11	126.4	8.6
Tonawanda.....	117.1	8.7	9	113.9	10.8	7	87.5	6.4

The following table shows the mortality from Pulmonary Tuberculosis in the cities of the State grouped in order of population — (Concluded)

CITIES	1908			1909		
	Total deaths from tuberculosis	Deaths per 100,000 population from tuberculosis	Percentage of total deaths from tuberculosis	Total deaths from tuberculosis	Deaths per 100,000 population from tuberculosis	Percentage of total deaths from tuberculosis
New York.....	8,867	204.4	12.1	8,645	194.2	11.7
Buffalo.....	526	134.3	8.7	523	131.8	8.6
<i>Cities 100,000 to 200,000 population:</i>						
Rochester.....	258	133.6	9.5	282	143.3	9.7
Syracuse.....	154	124.6	7.6	145	115.6	7.5
Albany.....	210	210.0	11.4	170	168.7	9.6
<i>Cities 50,000 to 100,000 population:</i>						
Troy.....	183	237.7	11.9	185	239.5	12.5
Schenectady.....	64	92.3	7.0	86	117.7	10.2
Yonkers.....	116	166.9	10.9	107	148.2	9.5
Utica.....	121	177.9	9.4	111	156.8	9.7
<i>Cities 20,000 to 50,000 population:</i>						
Binghamton.....	50	110.7	6.7	36	78.5	5.1
Elmira.....	33	92.3	6.1	34	97.8	6.2
Auburn.....	48	141.9	10.0	34	90.2	6.8
Niagara Falls.....	26	84.9	5.8	34	106.2	7.3
Jamestown.....	23	82.5	7.4	18	63.2	5.3
Newburgh.....	36	132.6	8.2	45	156.8	9.3
Watertown.....	22	80.2	5.4	30	106.6	7.0
Mount Vernon.....	35	129.0	9.0	29	104.0	7.4
Kingston.....	37	142.7	8.4	62	237.4	11.9
Poughkeepsie.....	41	158.8	8.5	34	130.5	6.8
Amsterdam.....	31	124.5	7.5	38	150.3	9.0
Cohoes.....	49	202.9	11.4	59	244.0	12.1
New Rochelle.....	24	100.9	7.3	23	92.2	7.1
Oswego.....	23	102.3	6.1	22	97.6	6.5
<i>Cities 15,000 to 20,000 population:</i>						
Gloversville.....	24	128.2	7.0	22	117.2	7.3
Rome.....	33	178.2	9.2	21	111.0	5.5
Lockport.....	27	150.5	10.8	23	127.8	8.3
Dunkirk.....	14	80.7	5.8	10	55.3	5.0
Middletown.....	25	152.6	9.4	20	120.4	7.8
Ithaca.....	16	104.5	6.4	13	83.4	6.1
<i>Cities 10,000 to 15,000 population:</i>						
Ogdensburg.....	14	94.0	5.6	17	114.0	7.0
Watervliet.....	26	178.4	10.3	29	198.5	12.6
Corning.....	16	107.6	6.9	12	78.0	5.5
Hornell.....	10	72.0	4.8	12	85.0	6.5
Geneva.....	11	83.4	7.3	15	110.7	8.9
Cortland.....	9	73.8	5.1	6	47.8	3.7
Rensselaer.....	13	108.2	8.7	12	80.8	7.0
Little Falls.....	16	140.0	11.8	18	155.6	9.9
Plattsburg.....	10	90.0	7.8	16	139.7	8.1
Hudson.....	18	165.7	10.8	14	126.9	8.1
North Tonawanda.....	11	102.1	7.2	8	72.9	4.9
Olean.....	9	86.1	6.5	9	50.0	4.3
<i>Cities below 10,000 population:</i>						
Port Jervis.....	14	141.7	8.3	8	80.4	4.4
Johnstown.....	7	73.3	5.7	10	105.5	6.4
Fulton.....	9	97.9	6.0	8	68.0	4.8
Oneida.....	10	114.0	7.5	5	49.5	3.6
Tonawanda.....	5	62.5	4.9	9	123.0	8.6

Mortality from Tuberculosis — Greater New York

YEAR	Population	Total deaths	Deaths from tuberculosis	Deaths per 100,000 population	Percentage of all deaths due to tuberculosis
1899.....	3,356,829	65,347	8,046	239	12.31
1900.....	3,446,131	70,870	8,162	237	11.52
1901.....	3,555,442	70,722	8,141	229	11.51
1902.....	3,667,828	68,131	7,589	207	11.14
1903.....	3,783,291	67,808	7,990	211	11.78
1904.....	3,902,073	72,043	8,516	218	11.82
1905.....	4,024,099	73,631	8,528	212	11.58
1906.....	4,149,615	75,962	8,976	216	11.82
1907.....	4,278,636	79,205	8,996	210	11.36
1908.....	4,338,322	73,075	8,867	204	12.13
1909.....	4,450,963	74,105	8,645	194	11.66

Mortality from Tuberculosis — Rest of the State

YEAR	Population	Total deaths	Deaths from tuberculosis	Deaths per 100,000 population	Percentage of all deaths due to tuberculosis
1899.....	3,810,662	56,484	5,366	141	9.49
1900.....	3,835,402	61,482	5,428	142	8.83
1901.....	3,879,454	60,739	5,625	145	9.26
1902.....	3,923,663	56,526	4,993	127	8.83
1903.....	3,968,084	59,794	5,204	131	9.43
1904.....	4,012,563	69,971	5,643	141	8.06
1905.....	4,057,234	63,591	5,536	136	8.70
1906.....	4,101,923	64,811	5,050	123	7.79
1907.....	4,146,697	68,685	5,435	138	8.00
1908.....	4,208,034	65,837	5,480	130	8.32
1909.....	4,248,680	65,156	5,351	126	8.09

The following table shows the city and rural mortality from Pulmonary Tuberculosis and death rate and percentage of deaths due to tuberculosis

CITIES	Population	All deaths	Death rate	Deaths from tuberculosis	Deaths per 100,000 population	Percentage of all deaths due to tuberculosis
<i>Albany county</i>	176,237	2,962	16.4	233	160.6	9.6
Albany.....	100,730	1,759	17.5	170	168.7	9.6
Cohoes.....	24,185	488	20.2	59	244.0	12.1
Watervliet.....	14,609	230	15.7	29	198.5	12.6
Rest of county.....	36,713	485	13.0	25	68.1	5.2
<i>Allegany county</i>	44,661	611	13.4	23	51.6	3.8
<i>Broome county</i>	74,786	1,363	18.2	89	119.0	6.6
Binghamton.....	45,855	712	15.5	36	78.5	5.1
Rest of county.....	28,931	651	22.5	53	183.2	8.2
<i>Cattaraugus county</i>	66,636	866	13.0	34	51.0	4.0
Olean.....	18,000	211	11.7	9	50.0	4.3
Rest of county.....	48,636	654	13.2	25	51.4	3.8
<i>Cayuga county</i>	66,309	1,062	16.1	66	101.1	6.3
Auburn.....	34,272	499	14.6	34	99.2	6.8
Rest of county.....	31,037	553	17.7	32	103.0	5.8
<i>Chautauque county</i>	103,532	1,382	13.3	62	69.9	4.6
Dunkirk.....	18,061	202	11.2	10	55.3	5.0
Jamesstown.....	28,495	343	12.0	18	63.2	5.3
Rest of county.....	56,976	837	14.4	34	59.7	4.1
<i>Chemung county</i>	61,600	851	16.6	64	124.0	7.6
Elmira.....	35,765	546	15.3	34	97.8	6.2
Rest of county.....	15,835	310	19.5	30	190.0	9.7
<i>Chenango county</i>	36,966	643	17.4	27	73.1	4.2
<i>Clinton county</i>	47,282	654	13.8	69	146.9	10.6
Plattsburgh.....	11,450	199	17.4	16	139.7	8.1
Rest of county.....	35,832	455	12.5	53	147.9	11.9
<i>Columbia county</i>	42,868	648	15.1	66	128.3	8.6
Hudson.....	11,032	172	15.6	14	126.9	8.1
Rest of county.....	31,836	476	14.8	41	125.6	8.5
<i>Cortland county</i>	31,043	413	13.3	19	61.2	4.6
Cortland.....	12,538	162	12.9	6	47.8	3.7
Rest of county.....	18,505	251	13.5	13	70.2	5.2
<i>Delaware county</i>	47,088	642	13.6	55	74.3	6.6
<i>Duchess county</i>	81,633	1,611	19.8	160	196.0	9.9
Poughkeepsie.....	26,039	501	19.2	34	130.5	6.8
Rest of county.....	55,594	1,110	20.0	126	226.6	11.4
<i>Erie county</i>	506,708	7,660	1.0	632	12.0	8.4
Buffalo.....	396,535	6,111	15.4	523	131.8	8.6
Lackawanna.....	11,370	159	13.2	22	193.4	14.8
Tonawanda.....	7,315	105	14.3	9	123.0	8.6
Rest of county.....	90,488	1,194	13.2	78	86.2	6.5
<i>Essex county</i>	33,848	619	16.3	42	111.8	9.2
<i>Franklin county</i>	60,336	793	16.8	166	327.8	21.0
<i>Fulton county</i>	42,330	674	16.9	48	113.1	7.1
Johnstown.....	9,473	155	16.4	10	105.5	6.4
Gloversville.....	18,761	300	16.0	22	117.2	7.3
Rest of county.....	14,096	219	15.4	16	113.5	7.4
<i>Genesee county</i>	36,930	636	14.6	36	97.6	6.3
<i>Greene county</i>	31,130	618	16.8	65	176.7	10.6
<i>Hamilton county</i>	4,912	4	9.0	1	20.1	2.3
<i>Herkimer county</i>	66,100	771	13.7	61	60.9	6.6
Little Falls.....	11,563	183	15.8	18	155.6	9.9
Rest of county.....	44,537	588	13.1	33	71.8	5.5
<i>Jefferson county</i>	83,427	1,177	14.1	73	87.6	6.2
Watertown.....	28,140	423	15.0	30	106.6	7.0
Rest of county.....	55,287	754	13.6	43	77.7	5.7
<i>Kings county (Brooklyn)</i>	1,605,925	24,365	16.2	2,348	166.0	9.6
<i>Lewis county</i>	26,043	369	13.8	11	37.6	2.7
<i>Livingston county</i>	36,460	695	16.3	61	167.4	10.3
<i>Madison county</i>	39,090	626	16.8	29	73.1	4.6
Onondaga.....	10,099	139	13.8	5	49.5	3.6
Rest of county.....	29,591	487	16.3	24	81.1	5.0
<i>Monroe county</i>	266,698	3,873	15.1	340	132.4	8.9
Rochester.....	196,793	2,913	14.8	282	143.3	9.7
Rest of county.....	59,905	960	16.0	58	96.8	6.1

The following table shows the city and rural mortality from Pulmonary Tuberculosis and death rate and percentage of deaths due to tuberculosis — (Continued)

CITIES	Population	All deaths	Death rate	Deaths from tuberculosis	Deaths per 100,000 population	Per-centage of all deaths due to tuberculosis
<i>Montgomery county</i>	51,848	783	15.1	73	140.8	9.3
Amsterdam.....	25,267	423	16.7	38	150.3	9.0
Rest of county.....	26,581	360	13.1	35	128.0	9.7
<i>Nassau county</i>	80,892	1,114	13.8	84	103.8	7.6
New York including Bronz.....	2,633,666	44,387	16.8	5,829	221.3	13.1
<i>Niagara county</i>	92,668	1,344	14.5	101	108.0	7.4
Lockport.....	18,105	276	15.2	23	127.3	8.3
Niagara Falls.....	32,012	465	14.5	34	106.2	7.3
North Tonawanda.....	10,987	162	14.7	8	72.9	4.9
Rest of county.....	31,464	441	13.8	35	108.0	7.8
<i>Oneida county</i>	144,673	2,657	17.7	221	153.8	8.6
Rome.....	18,917	382	20.2	21	111.0	5.5
Utica.....	69,458	1,153	16.6	111	159.8	9.7
Rest of county.....	56,198	1,020	17.9	89	158.3	8.8
<i>Onondaga county</i>	186,206	2,83	16.8	212	113.9	7.2
Syracuse.....	125,378	1,947	15.5	145	115.6	7.5
Rest of county.....	60,827	987	16.1	67	110.1	6.8
<i>Ontario county</i>	66,163	72	13.6	48	76.2	6.6
Geneva.....	13,543	175	12.9	15	110.7	8.9
Rest of county.....	41,610	577	13.7	27	60.1	4.4
<i>Orange county</i>	111,791	1,909	17.1	165	147.6	8.6
Middletown.....	16,610	256	15.4	20	120.4	7.8
Newburgh.....	27,418	482	17.2	45	156.8	9.3
Port Jervis.....	9,943	183	18.4	8	80.4	4.4
Rest of county.....	57,820	988	17.0	92	159.1	9.4
<i>Orleans county</i>	32,247	449	13.9	46	139.6	10.0
<i>Oswego county</i>	70,110	1,117	15.9	68	82.7	6.8
Fulton.....	11,759	167	14.2	8	68.0	4.8
Oswego.....	22,528	336	14.9	22	97.6	6.5
Rest of county.....	35,823	614	17.1	28	78.1	4.6
<i>Otsego county</i>	48,209	733	16.2	32	66.4	4.4
Oneonta.....	8,794	152	17.3	11	125.1	7.2
Rest of county.....	39,415	581	14.6	21	53.3	3.6
<i>Putnam county</i>	14,473	269	18.6	29	200.0	10.8
<i>Queens county</i>	233,709	3,838	16.4	309	132.2	8.1
<i>Rensselaer county</i>	134,637	2,208	16.4	263	187.3	11.4
Rensselaer.....	13,368	174	13.0	12	89.8	7.0
Troy.....	77,242	1,487	19.3	185	239.5	12.5
Rest of county.....	43,927	547	12.3	85	120.6	10.0
<i>Richmond county</i>	77,673	1,516	19.5	169	204.7	10.4
<i>Rockland county</i>	60,406	672	13.3	44	87.3	6.6
<i>St. Lawrence county</i>	90,813	1,466	16.2	108	118.9	7.4
Ogdensburg.....	14,921	245	16.4	17	114.0	7.0
Rest of county.....	75,892	1,210	15.8	91	117.2	7.4
<i>Saratoga county</i>	63,910	948	14.8	72	112.7	7.6
<i>Schenectady county</i>	82,918	988	11.9	98	118.2	10.0
Schenectady.....	73,037	846	11.6	86	117.7	10.2
Rest of county.....	9,881	142	14.3	12	121.5	8.5
<i>Schoharie county</i>	26,294	397	16.6	22	87.0	6.6
<i>Schuyler county</i>	16,122	207	13.7	9	69.6	4.3
<i>Seneca county</i>	26,316	531	20.9	67	226.1	10.7
<i>Steuben county</i>	81,814	1,464	17.8	74	90.4	6.1
Corning.....	15,339	217	14.1	12	78.0	5.5
Hornell.....	14,126	185	13.1	12	86.0	6.5
Rest of county.....	52,349	1,052	19.6	50	91.7	4.6
<i>Suffolk county</i>	84,909	1,706	20.1	164	193.2	9.6
<i>Sullivan county</i>	36,783	628	17.1	168	459.6	25.2
<i>Tioga county</i>	26,907	453	16.8	16	69.6	3.6
<i>Tompkins county</i>	34,307	499	14.6	34	99.1	6.8
Ithaca.....	15,584	211	13.5	13	83.4	6.1
Rest of county.....	18,723	288	15.3	21	112.1	7.3
<i>Ulster county</i>	86,660	1,620	16.6	138	169.2	9.1
Kingston.....	26,110	519	19.9	62	237.4	11.9
Rest of county.....	60,550	1,101	16.4	76	125.6	7.7

The following table shows the city and rural mortality from Pulmonary Tuberculosis and death rate and percentage of deaths due to tuberculosis — (Concluded)

CITIES	Population	All deaths	Death rate	Deaths from tuberculosis	Deaths per 100,000 population	Percentage of all deaths due to tuberculosis
<i>Warren county</i>	33,587	503	15.0	43	128.3	8.6
Glens Falls.....	16,279	226	13.9	24	147.4	10.6
Rest of county.....	17,248	277	15.7	19	104.3	6.6
<i>Washington county</i>	48,776	742	15.2	39	80.8	5.2
<i>Wayne county</i>	48,564	791	16.3	38	78.2	4.8
<i>Westchester county</i>	264,702	4,057	15.3	369	135.6	8.9
Mt. Vernon.....	27,891	392	14.1	29	104.0	7.4
New Rochelle.....	24,920	323	13.0	23	92.2	7.1
Yonkers.....	72,200	1,125	15.6	107	148.2	9.5
Rest of county.....	139,691	2,217	15.4	200	129.0	8.3
<i>Wyoming county</i>	32,107	419	13.1	13	40.6	3.1
<i>Yates county</i>	19,408	267	13.8	17	87.6	6.4
Total.....	8,699,643	140,261	16.1	13,996	160.3	10.0

Mortality from Tuberculosis in the Counties

The following table shows the annual death rate in each of the counties for 1909, and the number of deaths per 100,000 population from tuberculosis. The counties are arranged in order of death rate from tuberculosis from highest to lowest. The excessive death rate from tuberculosis in Sullivan and Franklin counties is due to the large number of patients sent there from other parts of the State.

COUNTY	Population	All deaths	Deaths per 1,000 population	Deaths from tuberculosis	Rate per 100,000 population, 1909
Sullivan.....	36,788	628	17.1	158	429.6
Franklin.....	50,336	793	15.8	165	327.8
Seneca.....	25,315	530	20.9	57	225.1
Richmond.....	77,673	1,515	19.5	159	204.7
New York*.....	2,633,656	44,387	16.9	5,829	200.8
Putnam.....	14,473	269	18.6	29	200.4
Dutchess.....	81,633	1,616	19.8	160	196.0
Suffolk.....	84,009	1,705	20.1	164	193.2
Rensselaer.....	134,537	2,208	16.4	252	187.3
Greene.....	31,130	518	16.6	55	176.7
Livingston.....	36,450	595	16.3	61	167.4
New York State.....	8,699,643	140,261	16.1	13,996	160.9
Albany.....	176,237	2,962	16.4	283	160.6
Ulster.....	86,660	1,520	16.5	138	159.2
Kings.....	1,505,925	24,365	16.2	2,348	155.9
Oneida.....	144,573	2,555	17.7	221	152.8
Orange.....	111,791	1,909	17.1	165	147.6
Clinton.....	47,282	654	13.8	69	145.9
Essex.....	33,848	519	15.3	48	141.8
Montgomery.....	51,848	783	15.1	73	140.8
Orleans.....	32,247	449	13.9	45	139.5
Westchester.....	264,702	4,057	15.3	359	135.6
Monroe.....	256,698	3,873	15.1	340	132.4
Columbia.....	42,868	648	15.1	55	128.3
Warren.....	33,527	503	15.0	43	128.3
Erie.....	505,708	7,560	15.0	632	125.0
Chemung.....	51,600	856	16.6	64	124.0
Broome.....	74,786	1,363	18.2	89	119.0
St. Lawrence.....	90,813	1,455	16.2	108	118.9
Schenectady.....	82,918	988	11.9	98	118.2
Onondaga.....	186,205	2,934	15.8	212	113.9
Fulton.....	42,330	674	15.9	48	113.1
Saratoga.....	63,910	948	14.8	72	112.7
Niagara.....	92,568	1,344	14.5	100	108.0
Nassau.....	80,892	1,114	13.8	84	103.8
Queens.....	233,709	3,838	16.4	309	103.2
Cayuga.....	65,309	1,052	16.1	66	101.1
Tompkins.....	34,307	499	14.5	34	99.1
Genesee.....	36,930	535	14.5	36	97.5
Steuben.....	81,814	1,454	17.8	74	90.4
Herkimer.....	56,100	771	13.7	51	90.9
Yates.....	19,408	267	13.8	17	87.6
Jefferson.....	83,427	1,177	14.1	73	87.5
Rockland.....	50,406	672	13.3	44	87.3
Schoharie.....	25,294	397	15.5	22	87.0
Oswego.....	70,110	1,117	15.9	58	82.7
Washington.....	48,776	742	15.2	39	80.8
Wayne.....	48,564	791	16.3	38	78.2
Ontario.....	55,153	752	13.6	42	76.2
Delaware.....	47,088	642	13.6	35	74.3
Chenango.....	36,955	643	17.4	27	73.1
Madison.....	39,690	626	15.8	29	73.1
Otsego.....	48,209	733	15.2	32	66.4
Cortland.....	31,043	413	13.3	19	61.2
Chautauqua.....	103,632	1,382	12.3	62	59.9

*Includes the Bronx.

Mortality from Tuberculosis in the Counties — (Concluded)

COUNTY	Population	All deaths	Deaths per 1,000 population	Deaths from tuberculosis	Rate per 100,000 population, 1909
Schuyler.....	15,122	207	13.7	9	59.5
Tioga.....	26,907	453	16.8	16	59.5
Allegany.....	44,661	604	13.5	23	51.5
Cattaraugus.....	66,636	885	13.0	34	51.0
Wyoming.....	32,107	419	13.1	13	40.5
Lewis.....	26,643	369	13.8	10	37.5
Hamilton.....	4,912	44	9.0	1	20.4

Mortality from Cancer

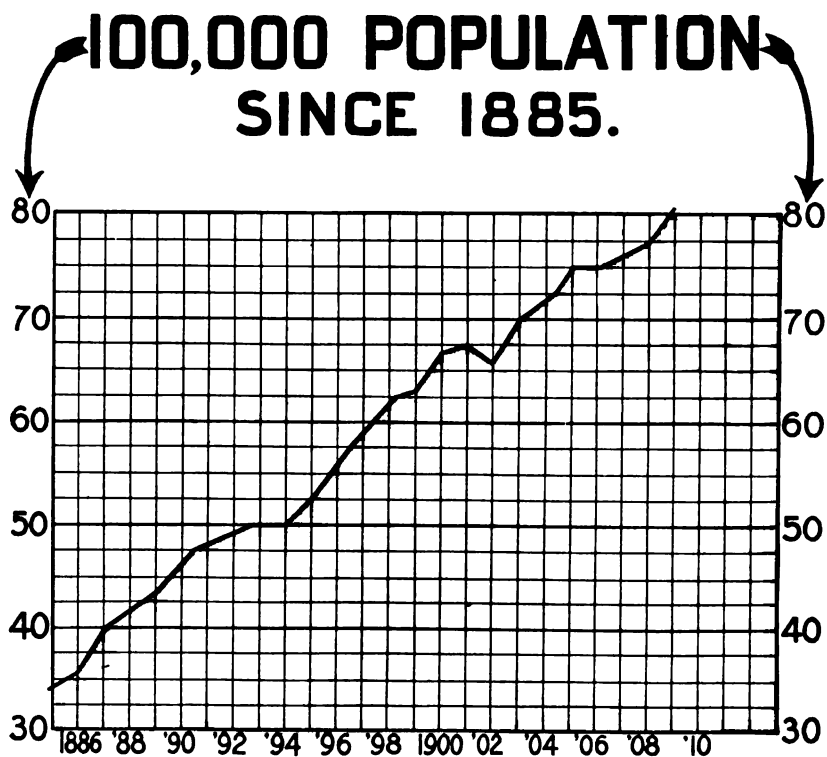
The reported mortality from cancer and deaths per 100,000 population due to cancer in the State since 1885 is shown by the following:

YEAR	Deaths from cancer	Deaths per 100,000 population	YEAR	Deaths from cancer	Deaths per 100,000 population
1885.....	1,887	33.6	1898.....	4,375	62.0
1886.....	2,050	35.8	1899.....	4,535	63.2
1887.....	2,363	40.5	1900.....	4,871	66.9
1888.....	2,497	41.9	1901.....	5,033	67.6
1889.....	2,638	43.5	1902.....	4,989	65.7
1890.....	2,868	46.3	1903.....	5,456	70.3
1891.....	3,028	47.9	1904.....	5,697	71.9
1892.....	3,152	48.9	1905.....	6,055	74.9
1893.....	3,232	49.4	1906.....	6,169	74.8
1894.....	3,305	49.7	1907.....	6,420	75.9
1895.....	3,554	52.7	1908.....	6,554	77.0
1896.....	3,789	55.3	1909.....	7,060	81.1
1897.....	4,131	59.4			

Reported mortality from Cancer in the sanitary districts for past 10 years —

DISTRICTS	1900	1901	1902	1903	1904	1905	1906	1907	1908	1909
Maritime.....	2,449	2,651	2,557	2,828	2,967	3,151	3,288	3,514	3,564	3,841
Hudson Valley.....	476	459	497	536	535	549	580	571	609	657
Adirondack and Northern.....	234	208	220	239	255	288	278	272	265	341
Mohawk Valley.....	295	267	282	276	314	331	310	352	336	397
Southern Tier.....	287	261	259	309	338	342	331	349	388	412
East Central.....	329	295	304	314	325	335	343	337	351	383
West Central.....	232	227	246	276	250	291	276	288	295	296
Lake Ontario and Western.....	569	665	624	678	713	768	763	717	746	738
Entire State.....	4,871	5,038	4,989	5,456	5,697	6,055	6,169	6,420	6,554	7,060

MORTALITY FROM CANCER. DEATHS PER 100,000 POPULATION SINCE 1885.



NEW YORK STATE DEPARTMENT OF HEALTH.

Deaths from Cancer per 100,000 population in the —

DISTRICTS	1900	1901	1902	1903	1904	1905	1906	1907	1908	1909
Maritime.....	62	66	65	61	71	72	72	75	75	79
Hudson Valley.....	68	67	72	77	78	78	82	80	86	80
Adirondack and Northern.....	60	53	58	60	64	75	68	66	64	81
Mohawk Valley.....	74	65	67	66	73	76	69	76	72	85
Southern Tier.....	65	63	60	72	78	78	75	80	87	91
East Central.....	79	74	76	79	80	80	82	80	83	90
West Central.....	71	71	78	86	80	90	87	91	93	92
Lake Ontario and Western.....	66	75	71	75	78	81	80	73	75	73
Entire State.....	66.9	67.6	66.7	70.3	71.9	74.9	74.8	75.9	77.0	81.1

In each 1,000 Deaths there were from Cancer in the —

DISTRICTS	Decade 1885-1894	Decade 1895-1904	1905	1906	1907	1908	1909
Maritime.....	21.6	31.8	39.4	30.9	40.7	44.6	47.4
Hudson Valley.....	25.8	37.6	44.2	48.1	44.1	49.5	53.3
Adirondack and Northern.....	32.0	42.0	48.0	45.1	48.1	43.8	54.5
Mohawk Valley.....	34.2	42.5	48.8	42.8	46.1	44.6	55.8
Southern Tier.....	35.5	46.5	53.5	51.3	50.5	55.7	59.1
East Central.....	36.4	51.8	52.0	53.8	50.3	51.2	57.8
West Central.....	37.5	49.5	57.2	56.1	55.2	60.8	60.5
Lake Ontario and Western.....	30.2	46.5	54.0	52.1	45.8	50.9	48.4
Entire State.....	25.0	37.0	44.2	43.9	43.4	47.3	50.3

During the past three years there were reported 18,994 deaths from cancer in this State, 7,634 (or 40.0 per cent.) being due to cancer of the stomach and liver, as will be seen from the following:

SEAT OF DISEASE	1907	1908	1909
Cancer of mouth.....	206	169	267
Cancer of stomach and liver.....	2,396	2,561	2,677
Cancer of intestines and peritoneum.....	812	849	926
Cancer of skin.....	201	200	202
Cancer of breast.....	617	599	665
Cancer of female genital organs.....	946	1,043	1,146
Cancer of other or unspecified organs.....	1,222	1,113	1,177
Total.....	5,400	6,534	7,060

Summary of all deaths from Cancer during 1909

There were 7060 recorded deaths from cancer during 1909. This table includes 7040 — the other 20 having been delayed returns not fully classified. The city departments of health of Greater New York, Buffalo, Yonkers and Albany classified their cancer deaths for this department, but as they could not be combined into one table on account of differences in form they are given below separately. A list of occupations, excluding those for Greater New York, follows the tables.

	Age										
	Total	Under 5 years	5-9	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90 and over
New York City	3,488	22	7	23	80	291	739	906	856	467	95
Albany	120			2	2	8	19	41	29	14	5
Yonkers	42			1	1	4	6	9	13	7	1
Buffalo	318		1	1	5	28	80	81	67	38	17
Rest of State	3,072	2	4	9	33	150	423	646	838	733	231
Total State	7,040	24	12	36	121	481	1,267	1,683	1,803	1,259	349

Summary of all deaths from Cancer during 1909 — (Concluded)

	Color		Sex		Social Relation			Nativity	
	White	Colored	Male	Female	Single	Married	Widowed and divorced	Native	Foreign
New York City.....	3,442	46	1,442	2,046	506	1,930	1,047	1,282	2,200
Albany.....	119	1	42	78	19	59	42	75	45
Yonkers.....	41	1	12	30	7	25	10	17	25
Buffalo.....	313	5	126	187	51	181	85	149	168
Rest of State.....	3,046	26	1,064	1,978	331	1,719	1,022	2,234	818
Total State.....	6,961	79	2,716	4,319	914	3,914	2,206	3,757	3,256

Deaths in City of New York from Cancer during the year 1909

CANCER, ETC., OF THE MOUTH

	Total both sexes	TOTAL BY SEX,		UNDER 1 YEAR		1 YEAR		2 YEARS		3 YEARS		4 YEARS		5-9 YEARS		10-14 YEARS	
		Males	Females	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females
White.....	129	114	15	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	1	.....	.....
Chinese.....	1	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Black.....	1	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Native.....	43	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	1	.....	.....
Foreign.....	87	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Unknown.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Single.....	27	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	1	.....	.....
Married.....	71	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Widowed and divorce'd	32	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Unknown.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

CANCER OF STOMACH, LIVER

White.....	1,405	748	657	.....	1	1	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....
Chinese.....	1	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Black.....	15	4	11	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Native.....	404	.....	.....	1	1	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....
Foreign.....	1,017	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Unknown.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Single.....	169	.....	.....	1	1	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....
Married.....	807	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Widowed and divorce'd	442	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Unknown.....	3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

CANCER OF INTESTINES, RECTUM

White.....	453	220	233	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....
Chinese.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Black.....	5	2	3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Native.....	168	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....
Foreign.....	289	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Unknown.....	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Single.....	76	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....
Married.....	250	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Widowed and divorce'd	133	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Unknown.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

CANCER OF FEMALE GENITAL ORGANS

White.....	545	.....	545	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Black.....	12	.....	12	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Native.....	238	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Foreign.....	316	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Unknown.....	3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Single.....	55	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Married.....	315	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Widowed and divorce'd	187	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Unknown.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

CANCER OF THE BREAST

White.....	314	4	310	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Black.....	4	.....	4	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Native.....	152	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Foreign.....	156	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Unknown.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Single.....	59	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Married.....	154	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Widowed and divorce'd	104	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Unknown.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

*Deaths in City of New York from Cancer during the year
1909 — (Continued)*

CANCER OF THE SKIN

	Total both sexes	TOTAL BY SEX		UNDER 1 YEAR		1 YEAR		2 YEARS		3 YEARS		4 YEARS		5-9 YEARS		10-14 YEARS	
		Males	Females	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females
White.....	70	39	31	...	1	...	...	...	...	...	...	...	...	...	...	...	...
Black.....	26	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...
Native.....	44	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Foreign.....	10	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...
Unknown.....	35	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Single.....	24	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Married.....	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Widowed and divorce'd	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Unknown.....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

CANCER OF OTHER ORGANS AND UNSPECIFIED

White.....	526	305	221	...	4	2	1	1	3	1	3	2	...	3	2	5	2
Black.....	6	2	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Native.....	241	...	...	...	4	2	1	1	3	1	3	2	...	3	1	5	2
Foreign.....	291	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...
Unknown.....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Single.....	110	...	...	...	4	2	1	1	3	1	3	2	...	3	2	5	2
Married.....	298	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Widowed and divorce'd	122	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Unknown.....	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

*Deaths in City of New York from Cancer during the year
1909 — (Continued)*

CANCER, ETC., OF THE MOUTH

	15-19 YEARS		20-29 YEARS		30-39 YEARS		40-49 YEARS		50-59 YEARS		60-69 YEARS		70-79 YEARS		80-89 YEARS		90 YEARS AND OVER	
	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females
White.....		1	1		5		24	3	33	3	28		18	5	2		1	
Chinese.....							1		1									
Black.....							1											
Native.....			1		3		8	1	12		9		5	1				
Foreign.....		1			2		18	2	20	3	19		13	4	2		1	
Unknown.....									1									
Single.....		1	1		3		8		7		1		2		1			
Married.....					2		16	3	21	1	14		12	1				
Widowed and divorced.....							2		4	2	13		4	4	1		1	
Unknown.....									1									

CANCER OF STOMACH, LIVER

White.....	1		9	8	47	30	134	123	204	182	222	185	108	102	20	15	1	2
Chinese.....					1				1									
Black.....									3	4		2	1	2			1	
Native.....			4	3	17	15	46	53	37	59	42	43	22	20	6	4		
Foreign.....	1		5	5	31	25	91	74	147	125	181	144	86	73	14	12	1	2
Unknown.....																		
Single.....	1		8	3	17	6	25	21	20	19	16	15	5	8	2	2		
Married.....			1	5	31	32	105	79	145	95	162	76	55	17	8			
Widowed and divorced.....						2	8	27	39	72	45	96	48	78	10	14	1	2
Unknown.....							1		2									

CANCER OF INTESTINES, RECTUM

White.....		2	7	9	16	26	38	41	49	56	66	56	40	34	3	9		
Chinese.....							1											
Black.....							1			1		2						
Native.....		1	3	2	4	13	17	21	20	21	22	20	11	10		2		
Foreign.....	1	4	7	12	13	23	20	28	36	45	38	29	23	3	7			
Unknown.....									1					1				
Single.....		2	4	4	1	4	11	10	8	8	5	8	5	5				
Married.....			2	5	14	21	26	26	35	31	47	14	20	5	1	3		
Widowed and divorced.....					1	1	3	5	6	18	15	36	15	24	2	6		
Unknown.....																		

CANCER OF FEMALE GENITAL ORGANS

White.....		3		14		74		150		151		84		28		11		
Black.....						3		4		2						1		
Native.....						48		76		68		29		13		3		
Foreign.....		2		10		34		108		85		55		15		9		
Unknown.....										2		1						
Single.....		3		2		12		19		6		11		1		1		
Married.....				12		56		137		80		25		3		2		
Widowed and divorced.....					1	9		28		67		49		24		9		
Unknown.....																		

CANCER OF THE BREAST

White.....				4		42	1	72	1	80		67	1	35	1	9		1
Black.....				1				3										
Native.....				4		18	1	40	1	24		29	1	18		5		1
Foreign.....				1		24		25		46		38		17	1	4		
Unknown.....																		
Single.....				1		7	1	11		13		17		7		1		1
Married.....				4		32		49	1	42		15	1	9	1			
Widowed and divorced.....						3		15		25		34		19		8		
Unknown.....												1						

Deaths in City of New York from Cancer during the year 1909 — (Concluded)

CANCER OF THE SKIN

	15-19 YEARS		20-29 YEARS		30-39 YEARS		40-49 YEARS		50-59 YEARS		60-69 YEARS		70-79 YEARS		80-89 YEARS		90 YEARS AND OVER	
	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females
White.....				1	1	1	5	3	11	4	11	9	11	7		5		
Black.....																		
Native.....					1	1	2	1	5	2	3	4	4	2				
Foreign.....				1			3	2	6	2	8	5	7	5		5		
Unknown.....																		
Single.....				1		1			2	1	8	5	1					
Married.....					1		4		2	3	3	2	2			2		
Widowed and divorced.....							1	2	1	1		4	4	5		3		
Unknown.....								1										

CANCER OF OTHER ORGANS AND UNSPECIFIED

White.....	4	4	14	10	23	11	49	46	71	55	81	40	43	33	5	6	1	1
Black.....				1		1		2	1				1					
Native.....	3	4	6	9	10	6	19	28	25	23	28	12	14	22	2	1		1
Foreign.....	1		8	2	13	6	30	20	47	32	53	28	30	11	3	5	1	
Unknown.....																		
Single.....	4	3	9	5	5	4	9	6	14	10	4	2	5	1				
Married.....		1	4	6	18		38	37	50	33	61	14	23	6	1			
Widowed and divorced.....							2	7	8	12	16	23	16	26	4	6	1	1
Unknown.....			1									1						

Deaths in Buffalo from Cancer during the year 1909

AGE	WHITE		NEGRO		NATIVE		FOREIGN BORN		NATIVITY UNKNOWN		SINGLE		MARRIED		WIDOWED		DIVORCED	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
5-10.....		1				1						1						
10-15.....																		
15-20.....	1				1						1							
20-30.....	2	2	1		2	2					2		2					
30-40.....	7	20		1	3	14	4	7			3	5	16			2		
40-50.....	26	52	2		12	29	16	22		1	6	22	40			5		
50-60.....	33	48			12	30	21	18			6	9	20	30	7	9		
60-70.....	32	34		1	7	15	25	20			3	4	17	9	10	21	2	1
70-80.....	21	17			8	8	13	9			1	2	15	2	5	13		
80-90.....	4	11			1	4	3	7				3	2	1	2	7		
90 and over.....		2				1		1				1				1		
Total.....	126	187	3	2	45	104	84	84		1	22	29	81	100	24	58	2	1

Deaths in Buffalo from Cancer during the year 1900 — (Cont'd)

ORGAN OR PART OF BODY AFFECTED

MALE		FEMALE	
Rectum.....	3	Peritoneum.....	1
Intestines.....	10	Intestines.....	15
Liver.....	16	Liver.....	20
Throat.....	1	Stomach.....	29
All organs.....	3	Gall bladder.....	1
Pancreas.....	1	Breast.....	22
Tongue.....	5	Hepatic.....	2
Face.....	5	Adrenals.....	1
Stomach.....	41	Pelvic.....	5
Eesophagus.....	7	Liver and pancreas.....	1
Mouth.....	1	Liver and stomach.....	1
Penis and inguinal.....	1	Spinal cord.....	1
Pancreas and stomach.....	1	Uterus and bladder.....	2
Hyoid.....	1	Neck, lung and muscles, right side..	1
Thorax.....	2	Bladder.....	1
Larynx and throat.....	1	Spine.....	1
Cheek.....	1	Pancreas.....	1
Prostrate gland.....	5	Lungs.....	2
Sigmoid flexure.....	1	Right axilla.....	1
Penis.....	1	All organs.....	6
Kidney.....	1	Right groin.....	1
Spleen.....	1	Rectum.....	7
Rectum and sigmoid.....	1	Face and scalp.....	1
Jaw.....	2	Thorax.....	1
Neck and face.....	2	Stomach and rectum.....	1
Bladder.....	1	Uterus and rectum.....	2
Liver, stomach and pancreas.....	1	Urethra.....	1
Thyroid.....	1	Stomach and breast.....	2
Gall, bladder and rectum.....	1	Sigmoid.....	5
Mediastinum.....	1	Eesophagus.....	2
Larynx and pharynx.....	1	Clitoris and labia.....	1
Neck.....	2	Thyroid gland.....	1
Stomach and liver.....	1	Uterus.....	37
Inferior maxilla.....	1	Uterus and pelvic.....	1
Lower lip and jaw.....	1	Neck.....	1
Thigh.....	1	Uterus and bladder.....	1
Liver, pancreas and omentum.....	1	Face.....	4
Larynx.....	1	Nose and forehead.....	1
Abdominal wall.....	1	Kidney.....	2
		Mouth.....	1
Total.....	129	Stomach and intestines.....	1
		Pyloric.....	1
		Total.....	189

Deaths in Yonkers from Cancer during the year 1909

CAUSE OF DEATH	Age								Color	
	10-15	20-30	30-40	40-50	50-60	60-70	70-80	80-90	White	Black
Carcinoma, cerebral.....			1						1	
Carcinoma, stomach.....			1	2	2	4	1		10	
Carcinoma, liver.....	1			2	1	2	1		8	
Carcinoma, breast.....			1	1		1			3	
Carcinoma, omentum and mesentery.....						2			2	
Carcinoma, pancreas.....							1		1	
Carcinoma, ventriculi.....						1			1	
Carcinoma, shoulder and pre-peritoneal glands.....								1	1	
Carcinoma, rectum.....				1					1	
Carcinoma, chest wall, pleuro and lung.....					1				1	
Carcinoma, thyroid gland.....						1			1	
Carcinoma, colon.....					1		1		2	
Carcinoma, uteri.....					2				1	1
Carcinoma, cervical, bronchial lymphatic glands.....					1				1	
Carcinoma, cachexia and prostate gland.....							1		1	
Carcinoma, tongue and mouth.....							1		1	
Carcinoma, intestines.....		1				2			3	
Carcinoma, parotid gland.....							1		1	
Carcinoma, bladder.....					1				1	
Total.....	1	1	4	6	9	13	7	1	41	1

Deaths in Yonkers from Cancer during the year 1909 — (Conc'd)

CAUSE OF DEATH	SEX AND SOCIAL CONDITION						NATIVITY		Occupation
	Male	Female	Single	Married	Widow	Widower	Native	Foreign	
Carcinoma, cerebral.....	1	1		1			1		
Carcinoma, stomach.....	4	9	2	6	2		4	6	
Carcinoma, liver.....	4	3	2	3	1	1	2	1	
Carcinoma, breast.....		1		2	1		2		
Carcinoma, omentum and mesentery.....	1								
Carcinoma, pancreas.....	1					1		1	
Carcinoma, ventriculi.....	1					1		1	
Carcinoma, shoulder and pre-peritoneal glands.....		1	1				1		
Carcinoma, rectum.....		1		1			1		
Carcinoma, chest wall, pleuro and lung.....		1		1			1		
Carcinoma, thyroid gland.....		2		2				2	
Carcinoma, colon.....		2		2				1	
Carcinoma, uteri.....							1	1	
Carcinoma, cervical, bronchial lymphatic glands.....		1		1			1		
Carcinoma, cachexia and prostate gland.....	1			1				1	
Carcinoma, tongue and mouth.....	1	3	1		2			3	
Carcinoma, intestines.....				1				1	
Carcinoma, parotid gland.....	1					1		1	
Carcinoma, bladder.....	1			1				1	
Total.....	12	30	7	25	6	4	17	25	

Deaths from Cancer in Albany during 1909

	Total	Age															
		Female, 10-15	Female, 15-20	Male, 20-30	Female, 20-30	Male, 30-40	Female, 30-40	Male, 40-50	Female, 40-50	Male, 50-60	Female, 50-60	Male, 60-70	Female, 60-70	Male, 70-80	Female, 70-80	Male, 80-90	Female, 80-90
Cancer, mouth.....	2	.....	.....	.....	.....	.....	.....	1	.....	1	.....	.....	.....	.....	.....	.....	.....
Cancer, stomach and liver.....	35	.....	.....	1	.....	.....	.....	.....	1	8	5	3	8	3	3	2	1
Cancer, peritoneum, intestines and rectum.....	20	1	.....	.....	.....	2	1	.....	2	4	5	1	1	.....	3	.....	.....
Cancer, female genitals.....	18	.....	.....	.....	1	.....	2	.....	6	.....	4	.....	4	.....	.....	.....	1
Cancer, breast.....	11	.....	.....	.....	.....	.....	2	.....	1	.....	3	.....	5	.....	.....	.....	1
Cancer, other organs.....	34	.....	1	.....	.....	1	.....	2	6	6	6	4	3	1	4	.....	.....
Total.....	120	1	1	1	1	3	5	3	16	19	22	8	21	4	10	2	3

Deaths from Cancer in Albany during 1909 — (Continued)

	Total	Sex		SOCIAL RELATIONS					
		Male	Female	Male, married	Female, married	Male, single	Female, single	Male, widowed	Female, widowed
Cancer, mouth.....	2	2	.....	1	.....	1	.....	.....	.....
Cancer, stomach and liver.....	35	17	18	11	4	.....	4	6	10
Cancer, peritoneum, intestines and rectum.....	20	7	13	4	6	2	2	.....	5
Cancer, female genitals.....	18	.....	18	.....	6	.....	5	.....	7
Cancer, breast.....	11	.....	11	.....	5	.....	1	.....	5
Cancer, other organs.....	34	14	18	10	12	3	1	1	5
Total.....	120	40	78	26	33	6	13	8	32

Deaths from Cancer in Albany during 1909 — (Concluded)

	Total	NATIVITY												
		Male, native	Female, native	Male, Irish	Female, Irish	Male, German	Female, German	Female, England	Female, Scotland	Male, Russia	Female, Russia	Male, African	Male, French	Female, French
Cancer, mouth.....	2	2												
Cancer, stomach and liver.....	35	11	7		7	3	2	1	1			1		
Cancer, peritoneum, intestines and rectum.....	20	4	9		1	1	2			1	1			
Cancer, female genitals.....	18		12		3		1				1			1
Cancer, breast.....	11		9				1							1
Cancer, other organs.....	34	13	8		7		1				1		1	1
Total.....	120	30	45		18	4	7	1	1	1	3	1	1	3

Deaths from Cancer during 1909 for rest of State

	Total	NATIVITY															
		United States	Foreign	Austria	Canada	Denmark	England	France	Germany	Holland	Hungary	Ireland	Italy	Poland	Russia	Scotland	Sweden
Abdominal organs and pelvis	42	34	8		2		1		2	1	1	1					
Bladder	70	51	19		3	1	2		5								
Brain	1		1									1					
Breast	335	274	59		14		8	4	10	1		18	1			3	
Esophagus	19	15	4						1			1		1			
Eye and ear	13	7	6		1				1			4					
Face	122	83	38		4		2	1	5			23	1				1
Intestines	291	211	80	1	10	1	9		23			20	3	3		3	2
Kidney	18	13	5			1			2			1	1				1
Liver	333	238	92	2	16	3	13	1	27			23	3		1	1	2
Lung	27	22	5		1							3					
Mouth, lip, jaw, etc.	80	49	30		4			1	5			19					1
Neck	35	25	10				1		3			5					1
Omentum	11	8	3				1		1			1					
Ovary	17	15	1						1								
Pancreas	29	21	6				3					1	1				
Penis	10	6	4				1					2					
Pharynx	2	1	1						1								
Prostate	22	15	6	1			1	2				1				1	
Rectum	112	86	26		2		2		6			11	1				1
Spleen	12	10	2									1	1				
Stomach	749	496	247	4	21	1	27	5	80	8		55	9	2	6	12	6
Throat	38	31	7				2		1			3					1
Thyroid	4	2	2		1			1									
Tongue	33	19	13		1				4			6	1			1	
Tonsil	3	2	1						1			1					
Uterus	511	396	113	4	17		18	1	26	1		29	6	2	2	3	1
Vertebra	2	1	1				1										
General carcinomatosis	131	103	28	1	6		4		6			8	2	1			
Total*	3,072	2,234	818	13	102	7	95	15	212	11	1	244	29	10	8	23	16

Deaths from Cancer during 1909 for rest of State — (Continued)

	Total	AGES									
		1-5	5-10	10-15	15-20	20-30	30-40	40-50	50-60	60-70	70-80
Abdominal organs and pelvis	42			1			4	5	12	9	6
Bladder	70						2	9	19	22	17
Brain	1										1
Breast	335						18	57	68	77	81
Esophagus	19							5	5	5	4
Eye and ear	13	2								4	6
Face	122						2	5	18	27	37
Intestines	291		3			3	10	34	68	80	82
Kidney	18						1	4	4	6	2
Liver	333					2	10	43	70	115	77
Lung	27				1	2	1	4	13	4	2
Mouth, lip, jaw, etc.	80					1	2	2	20	21	24
Neck	35			1		1		5	5	14	6
Omentum	11						2	1	1	5	2
Ovary	17					1	4	6	5	1	
Pancreas	29			1		1		6	4	9	6
Penis	10								4	1	2

Deaths from Cancer during 1909 for rest of State — (Continued)

	Total.	Ages											
		1-5	5-10	10-15	15-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90 and over
Pharynx.....	2								1		1		
Prostate.....	23						2		2	5	10	2	1
Rectum.....	112						8	14	22	29	31	8	
Spleen.....	12			1	1				1	4	3	1	
Stomach.....	749				1	4	20	87	141	222	212	58	4
Throat.....	38					2	2	4	7	12	8	3	
Thyroid.....	4									3		1	
Tonsil.....	33					1		2	5	18	4	3	
Tongue.....	3					1	1		1				
Uterus.....	511				1	10	50	111	125	104	91	18	1
Vertebra.....	2						1			1			
General carcinomatosis.....	131		1	1		4	10	18	25	40	18	11	3
Total*.....	3,072	2	4	5	4	33	150	423	646	838	733	208	23

Deaths from Cancer during 1909 for rest of State — (Concluded)

	Total	COLOR		SEX		SOCIAL RELATION			
		White	Colored	Male	Female	Single	Married	Widowed	Divorced
Abdominal organs and pelvis.....	42	42		11	31	6	18	18	
Bladder.....	70	68	2	40	30	7	46	16	1
Brain.....	1	1			1			1	
Breast.....	335	334	1	2	333	51	162	122	
Esophagus.....	19	19		12	7	3	12	4	
Eye and ear.....	13	13		10	3	3	7	3	
Face.....	122	121	1	92	30	12	57	53	
Intestines.....	291	288	†3	110	181	37	162	92	
Kidney.....	18	18		9	9	2	11	5	
Liver.....	333	333		118	215	33	195	104	1
Lung.....	27	27		5	22	7	13	7	
Mouth, lip, jaw, etc.....	80	80		63	17	8	37	35	
Neck.....	35	35		27	8	5	20	10	
Omentum.....	11	11		2	9	1	7	3	
Ovary.....	17	17			17	5	11	1	
Pancreas.....	29	28	1	18	11	3	21	5	
Penis.....	10	9	1	10			5	2	
Pharynx.....	2	2		1	1	3		1	
Prostate.....	22	21	1	22			16	6	
Rectum.....	112	111	1	45	67	9	61	42	
Spleen.....	12	12		8	4	2	8	2	
Stomach.....	749	740	9	379	370	70	429	248	2
Throat.....	38	38		26	12	6	22	10	
Thyroid.....	4	4		2			3	1	
Tongue.....	33	33		26	7	4	21	8	
Tonsil.....	3	3		3		1	2		
Uterus.....	511	506	5		511	35	296	175	2
Vertebra.....	2	2		1	1	1	1		
General carcinomatosis.....	131	130	1	54	77	17	72	42	
Total*.....	3,072	3,046	26	1,096	1,976	331	1,719	1,016	6

* Remarks: Age unknown, 3; nativity unknown, 20; other nationalities: 1, Japan; 2, Nova Scotia; 2, Newfoundland; 1, Prussia; 1, Bavaria; 1, Roumania.

† 3 Indian.

Occupations

Accountant, 1.	Carriage maker, 1.
Actor, 1.	Carriage painter, 1.
Actress, 1.	Chairmaker, 1.
Architect, 2.	Cheesemaker, 1.
Baker, 1.	Chemist, 1.
Banker, 3.	Cigarmaker, 4.
Barber, 1.	Civil engineer, 1.
Bartender, 2.	Clergymen, 14.
Bayman, 3.	Clerk, 15.
Blacksmith, 14.	Cloak designer, 1.
Bloomer, 1.	Coachman, 7.
Boarding-house keeper, 1.	Coal and lumber dealer, 1.
Boat builder, 1.	Coal dealer, 1.
Boatman, 3.	Collector, 2.
Bobbin maker, 1.	Contractor, 4.
Boilermaker, 1.	Cook, 12.
Bookkeeper, 4.	Cooper, 4.
Brewer, 2.	Coppersmith, 2.
Brick burner, 1.	Coremaker, 1.
Bricklayer, 2.	Decorator, 2.
Brickmaker, 2.	Dentist, 2.
Bridgetender, 2.	Domestic, 41.
Broker, 1.	Dramatic Agent, 1.
Brushmaker, 1.	Dressmaker, 15.
Builder, 3.	Driver, 9.
Businessman, 8.	Druggist, 1.
Butcher, 6.	Editor, 1.
Buyer of dairy products, 1.	Engineer, 22.
Cabinetmaker, 7.	Factory hand, 4.
Canvasser, 1.	Farmer, 144.
Capitalist, 2.	Fireman, 3.
Captain, 3.	Fisherman, 1.
Carbuilder, 1.	Flagman, 1.
Car inspector, 1.	Foreman, 3.
Carpenter, 52.	Foundryman, 3.
Carpet weaver, 1.	Fruit dealer, 1.

Occupations — (Continued)

Gardener, 10.	Milk condenser, 1.
Gasfitter, 1.	Miller, 1.
Glover, 5.	Millhand, 3.
Grocer, 9.	Milliner, 4.
Hardware, 1.	Millwright, 1.
Harnessmaker, 1.	Miner, 2.
Hatter, 6.	Molder, 8.
Horseshoe puncher, 1.	Musician, 7.
Hostler, 2.	Music teacher, 1.
Hotelkeeper, 10.	Navigation, 3.
Inspector street railway, 1.	Nickel plater, 2.
Insurance agent, 12.	Nurse, 14.
Ironworker, 6.	Oilman, 1.
Janitor, 7.	Oil operator, 2.
Jeweler, 2.	Oil producer, 1.
Knee staker, 1.	Onion raiser, 1.
Laborer, 158.	Optician, 1.
Laundress, 6.	Painter, 13.
Laundryman, 1.	Paperhanger, 2.
Lawyer, 7.	Patternmaker, 1.
Leather dresser, 1.	Peddler, 5.
Liveryman, 5.	Photographer, 2.
Live stock dealer, 1.	Physician, 4.
Lumber dealer, 4.	Pilot, 1.
Lumberman, 1.	Plumber, 5.
Machinist, 9.	Policemen, 4.
Mail carrier, 2.	Polisher, 1.
Manufacturer, 1.	Porter, 1.
Marble cutter, 1.	Postmaster and harnessmaker, 1.
Manager express company, 1.	Printer, 8.
Manager yacht club, 1.	Professor, 1.
Mason, 11.	Railroad employee, 19.
Mason contractor, 1.	Rawhide factory supt., 1.
Matron, 1.	Railroad towerman, 1.
Mechanic, 4.	Real estate agent, 4.
Merchant, 15.	Real estate dealer, 2.

Occupations — (Concluded)

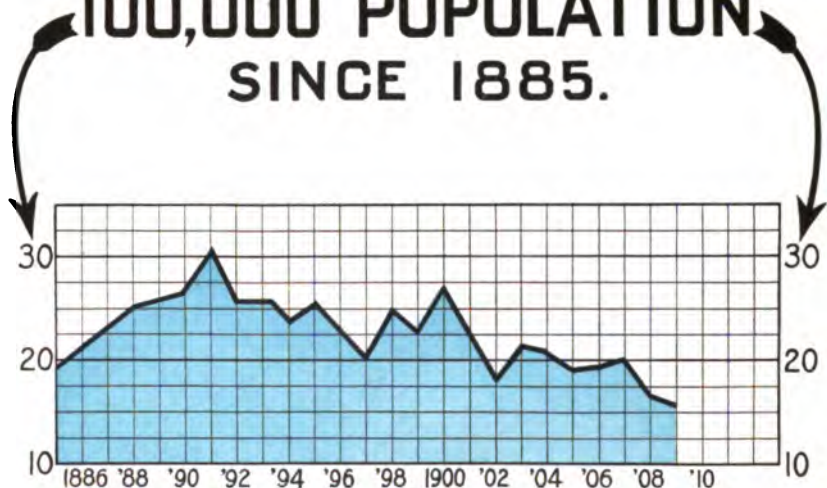
Sailor, 3.	Superintendent, 1.
Salesman, 5.	Tailor, 10.
Saleswoman, 3.	Tailoress, 1.
Saloonkeeper, 1.	Tanner, 2.
Seamstress, 7.	Teacher, 22.
Servant, 1.	Teamster, 9.
Shawlmaker, 1.	Telegrapher, 3.
Ship carpenter, 2.	Tinsmith, 2.
Ship joiner, 4.	Treasurer in bank, 1.
Shipper, 2.	Undertaker, 3.
Shoemaker, 16.	Wagon maker, 3.
Shoe operator, 3.	Waiter, 1.
Slate maker, 3.	Washing, ironing, cleaning, 1.
Shoe officer, 3.	Watchmaker, 1.
Spinner, 1.	Watchman, 7.
Stationary engineer, 4.	Water inspector, 1.
Stenographer, 5.	Weaver, 2.
Stonecutter, 4.	Wheelwright, 3.
Student, 3.	Wood turner, 4.

Mortality from Typhoid Fever

The following table shows the reported mortality from typhoid fever and deaths per 100,000 population due to typhoid since 1885:

YEAR	Deaths	Deaths per 100,000 popula- tion	YEAR	Deaths	Deaths per 100,000 popula- tion
1885	1,067	19.0	1898	1,810	25.6
1886	1,169	20.4	1899	1,604	22.4
1887	1,327	22.7	1900	1,948	26.7
1888	1,483	24.9	1901	1,741	23.4
1889	1,550	25.6	1902	1,318	17.4
1890	1,612	26.1	1903	1,665	21.5
1891	1,926	30.5	1904	1,652	20.9
1892	1,664	25.8	1905	1,554	19.2
1893	1,685	25.7	1906	1,568	19.0
1894	1,640	24.7	1907	1,673	19.8
1895	1,716	25.4	1908	1,375	16.0
1896	1,542	22.6	1909	1,315	15.1
1897	1,351	19.4			

MORTALITY FROM TYPHOID FEVER. DEATHS PER 100,000 POPULATION SINCE 1885.



NEW YORK STATE DEPARTMENT OF HEALTH



Deaths from Typhoid Fever per 100,000 population in the —

DISTRICTS	1900	1901	1902	1903	1904	1905	1906	1907	1908	1909
Maritime.....	20.2	20.0	20.2	16.8	17.0	16.2	15.2	17.2	13.2	12.6
Hudson Valley.....	50.7	34.3	36.0	25.4	35.1	28.4	26.1	27.3	21.5	20.0
Adirondack and Northern..	38.5	24.4	24.7	27.8	31.5	26.7	27.9	26.1	18.9	19.1
Mohawk Valley.....	34.0	26.4	19.8	23.4	19.4	18.4	19.4	17.2	17.0	13.5
Southern Tier.....	32.9	24.8	23.3	25.5	21.2	17.5	27.9	20.8	20.1	22.5
East Central.....	27.4	25.7	17.7	17.1	19.4	16.9	14.1	18.8	17.0	16.0
West Central.....	28.8	19.0	15.8	36.7	20.5	18.0	19.4	14.3	19.0	13.7
Lake Ontario and Western..	23.3	28.0	27.8	30.4	24.5	25.2	25.8	27.1	22.8	20.0
Entire State.....	26.7	23.4	17.4	21.5	20.9	19.2	19.0	19.8	16.0	15.1

In each 1,000 deaths there were from Typhoid Fever in the —

DISTRICTS	1900	1901	1902	1903	1904	1905	1906	1907	1908	1909
Maritime.....	10	10	11	10	9	9	8	9	8	8
Hudson Valley.....	28	20	23	14	20	17	15	15	13	12
Adirondack and Northern..	26	17	20	21	22	18	19	17	13	13
Mohawk Valley.....	23	17	14	16	13	12	12	10	11	9
Southern Tier.....	24	18	17	20	11	12	19	13	13	15
East Central.....	20	18	13	14	12	11	9	11	10	11
West Central.....	20	13	11	24	13	11	13	9	13	9
Lake Ontario and Western..	17	20	20	21	17	17	16	17	15	13
Entire State.....	17	13	14	14	12	12	11	11	10	9

The following table shows the Mortality from Typhoid Fever in the Cities of New York State, the average number of deaths per 100,000 population during the past ten years, total deaths and death rate for the year 1909 and source of water supply.

CITY	1900		1901		1902		1903		1904		1905		1906	
	Total deaths	Rate per 100,000	Total deaths	Rate per 100,000	Total deaths	Rate per 100,000	Total deaths	Rate per 100,000	Total deaths	Rate per 100,000	Total deaths	Rate per 100,000	Total deaths	Rate per 100,000
<i>Cities using unfiltered lake water:</i>														
Auburn.....	12	39.5	7	22.9	3	9.7	8	25.8	9	28.8	5	15.9	4	12.1
Buffalo.....	90	25.5	98	27.4	123	33.9	133	36.2	91	24.4	90	24.0	90	23.6
Dunkirk.....	6	51.6	4	32.4	10	76.5	4	29.0	6	41.3	6	39.2	5	31.4
Geneva.....	0	.....	5	46.3	1	9.0	6	52.1	5	42.0	4	22.7	3	24.0
Syracuse.....	31	29.1	20	18.1	10	8.9	18	15.8	17	14.7	17	14.5	11	9.2
<i>Cities using unfiltered river water:</i>														
Cohoes.....	27	113.0	14	58.4	32	133.2	22	91.3	25	103.6	14	57.9	14	57.8
Lockport.....	3	18.0	12	71.5	6	33.4	13	75.7	6	34.6	9	51.8	12	67.6
Niagara Falls.....	24	123.3	30	143.7	33	148.1	27	114.0	34	135.3	49	184.4	43	154.5
North Tonawanda.....	1	11.0	3	32.3	1	10.5	4	41.1	3	30.2	4	36.3	2	19.3
Ogdensburg.....	6	39.5	4	31.4	8	62.3	8	61.7	9	68.9	7	53.1	10	67.3
Oswego.....	10	45.0	5	22.4	4	17.5	12	53.5	14	62.3	19	84.1	13	58.0
Rome.....	21.7	6.5	1	12.2	3	25.2	3	18.6	4	24.5	7	42.3	5	28.2
Tonawanda.....	1	13.4	1	13.3	0	.....	2	26.0	3	38.4	2	25.3	4	50.6
<i>Cities using filtered river water:</i>														
Albany.....	38	40.3	20	21.1	29	30.2	19	19.7	18	18.5	19	19.3	20	20.3
Binghamton.....	17	42.8	21	52.4	11	27.1	4	9.7	4	9.6	5	12.0	4	9.1
Elmira.....	17	47.6	9	25.4	14	36.7	28	80.0	15	51.6	10	28.8	16	44.7
Poughkeepsie.....	11	45.7	10	41.1	5	20.3	11	44.2	18	59.7	11	43.3	10	39.4
Rensselaer.....	54.2	93.7	5	61.6	8	91.2	3	31.8	9	89.4	4	37.3	2	18.6
Watertown.....	67.2	101.4	8	35.6	15	64.7	17	71.0	52	211.0	6	23.6	13	50.0
Watervliet.....	11	77.0	8	55.6	9	62.3	8	55.2	9	61.8	7	47.9	7	47.7
<i>Cities using well or spring water:</i>														
Corning.....	6	54.2	5	43.2	3	24.9	6	48.0	6	46.1	4	30.0	6	42.1
Cortland.....	3	33.2	11	116.2	1	10.1	0	.....	1	9.2	3	26.6	1	8.7
Fulton.....	0	.....	2	24.0	1	11.8	8	93.2	3	34.8	2	22.6	5	56.5
Ilwaco.....	6	45.6	6	44.6	1	7.3	50	357.0	4	27.9	2	13.7	1	6.8

Olmal.....	18.5	1	10.5	2	20.8	3	30.7	3	30.3	2	20.0	0	...	2	20.0
Jamestown.....	26.6	9	30.3	6	25.5	1	4.1	6	34.1	16	32.7	6	23.0	9	32.8
Schenectady.....	22.4	14	44.2	15	40.5	11	26.0	16	33.5	12	22.6	5	8.6	11	17.8
<i>Cities using water from streams and reservoirs:</i>															
Amsterdam.....	18.6	3	14.3	5	23.2	4	18.1	10	44.0	4	17.1	4	18.7	6	24.8
Glen Falls.....	35.7	6	47.6	8	61.4	2	14.9	4	28.9	7	49.2	3	27.4	7	46.6
Gloversville.....	19.4	9	49.0	1	5.4	8	43.3	2	10.8	1	5.4	4	21.4	1	5.3
Johnstown.....	17.1	7	69.1	0	...	12	20.0	3	30.1	0	...	1	10.2	2	20.4
Newburgh.....	29.5	11	44.1	0	...	5	29.3	9	34.7	11	42.0	10	37.1	11	41.3
New Rochelle.....	22.8	1	6.8	6	38.0	5	11.0	4	22.0	3	15.5	4	19.5	5	23.2
Pittsburg.....	21.2	1	23.7	3	34.1	1	11.0	2	21.1	0	...	4	36.2	3	23.7
Rochester.....	13.7	20	18.4	32	19.2	19	11.2	21	12.1	27	15.2	19	10.5	20	18.2
Troy.....	76	101.2	42	42	55.7	37	48.8	25	32.8	34	44.4	36	46.8	28	36.2
Utica.....	44.9	8	14.1	9	15.6	12	20.3	10	16.6	11	17.6	6	9.5	18	27.6
Port Jervis.....	17.3	3	31.9	3	31.8	5	52.5	7	73.1	7	72.6	7	72.2	3	31.0
New York (Greater).....	17.0	718	20.8	727	20.4	762	20.8	634	16.8	699	16.9	635	15.8	639	15.5
Little Falls.....	34.3	13	125.2	3	28.5	4	37.5	0	27.7	4	36.4	0	...	5	44.7
Oneida.....	14.5	1	13.3	2	25.9	3	38.0	0	...	3	36.3	0	...	1	11.8
<i>Cities using filtered surface water:</i>															
Hornell.....	23.3	3	25.1	4	22.8	4	32.1	7	55.0	1	7.7	4	30.2	1	7.5
Hudson.....	53.8	9	94.4	4	41.3	8	81.3	3	30.0	17	167.7	5	46.5	4	38.0
Kingston.....	19.5	2	8.1	3	12.1	4	16.0	5	19.9	3	11.8	8	31.3	4	18.6
Middletown.....	24.2	2	13.7	2	13.6	8	55.1	2	13.8	1	6.9	6	41.3	3	18.8
Mount Vernon.....	14.8	1	4.9	3	13.6	2	8.8	2	8.5	5	20.6	5	20.0	5	19.4
Oneonta.....	43.0	2	27.9	1	13.6	3	66.5	2	26.0	4	50.8	2	24.8	4	48.6
Yonkers.....	9.5	2	4.1	8	15.9	5	9.3	8	14.2	9	15.2	1	1.6	4	6.2

The following table shows the Mortality from Typhoid Fever in the Cities of New York State, the average number of deaths per 100,000 population during the past ten years, total deaths and death rate for the year 1909 and source of water supply — (Concluded)

CITY	SOURCE OF WATER SUPPLY						
	1907		1908		1909		
	Total deaths	Rate per 100,000	Total deaths	Rate per 100,000	Total deaths	Death rate per 100,000	
<i>Cities using unfiltered lake water:</i>							
Auburn.....	2	6.0	16	46.6	6	17.5	Owasco lake.
Buffalo.....	113	29.2	84	21.2	96	24.2	Lake Erie.
Dunkirk.....	12	71.8	2	11.1	2	11.1	Lake Erie.
Geneva.....	2	15.4	3	22.1	2	14.7	Seneca lake.
Syracuse.....	14	11.6	19	15.2	14	11.1	Skanawake lake.
<i>Cities using unfiltered river water:</i>							
Cobles.....	19	78.2	15	62.0	20	82.2	Mohawk river. (Mechanical water filter being installed.)
Lockport.....	9	50.1	11	60.7	9	49.7	Erie canal. New supply being used recently from the Niagara river at North Tonawanda.
Niagara Falls.....	37	126.0	28	87.1	24	74.9	Niagara river. Water supplied to one part of the town is partly filtered.
North Tonawanda.....	5	47.2	6	84.6	6	55.6	Niagara river.
Ogdensburg.....	7	47.1	4	26.8	4	26.8	Oswegatchie river.
Oswego.....	15	66.0	14	62.2	6	26.6	Oswego river.
Rome.....	3	17.0	5	26.4	3	16.0	Mohawk river until November, 1909; since then, Fish creek.
Tonawanda.....	2	25.0	7	96.6	2	27.3	Niagara river.
<i>Cities using filtered river water:</i>							
Albany.....	20	20.0	11	10.9	19	18.8	Hudson river. Filtered since September, 1899; also some unfiltered surface water. (Slow sand filtration.)
Binghamton.....	8	18.2	7	15.2	6	13.1	Susquehanna river. Filtered since June, 1902. (Mechanical filtration.)
Elmira.....	10	28.0	11	30.7	12	33.5	Chemung river and storage reservoir on Hoffman creek; all water is filtered since 1890. (Mechanical filters.)
Poughkeepsie.....	29	112.0	9	34.5	6	23.0	Hudson river. Filtered. Plant improved fall of 1907. (Slow sand filter.)
Rensselaer.....	7	58.3	4	20.0	4	29.9	Hudson river. Filtered since 1902. (Mechanical sand strainer.)
Watertown.....	10	37.1	11	36.0	11	39.0	Black river. Filtered since October, 1904. (Mechanical filter.)
Watervliet.....	3	20.4	6	41.1	1	6.8	Mohawk river. Filtered. (Sack strainer.)
<i>Cities using well or spring water:</i>							
Corning.....	10	69.0	12	78.2	19	12.8	Springs.
Cortland.....	3	24.6	1	7.9	3	23.9	Springs.

	2	23.0	5	42.5	0	0	
Fulton.....	2	23.0	5	42.5	0	0	Wells and springs.
Itasca.....	0	.....	1	6.4	3	19.2	Six Mile creek. Unfiltered until epidemic in 1903. Since then a filter has been used or water has been taken from deep wells and springs.
Osage.....	2	19.1	3	22.1	2	11.1	Driven wells.
Jamestown.....	5	18.2	5	17.5	5	17.5	Artesian wells.
Schenectady.....	6	8.7	8	10.9	8	10.9	Large wells. Use of Mohawk river discontinued 1903.
Cities using water from streams and reservoirs:							
Amsterdam.....	4	15.9	0	0	3	11.9	Creeks with large reservoirs.
Glen Falls.....	7	45.3	6	36.9	1	6.1	Surface streams and storage reservoir.
Gloversville.....	1	5.3	7	37.3	2	10.7	Streams and storage reservoirs.
Johnstown.....	0	.....	2	21.1	0	0	Springs and streams.
Newburgh.....	11	41.0	10	36.4	13	47.4	Small streams and storage reservoir.
New Rochelle.....	5	22.0	7	28.0	6	24.1	Surface streams and storage reservoirs.
Plattsburg.....	3	27.6	0	0	3	26.2	Small quantity from wells at times.
Rochester.....	27	14.3	23	11.6	17	8.6	Hemlock lake and tributaries.
Troy.....	20	25.8	27	34.9	17	22.0	Small lakes and streams.
Utica.....	10	15.2	14	20.1	11	15.8	Partial use of Hudson river discontinued May, 1906.
Port Jervis.....	5	51.0	0	0	2	20.1	Small surface streams.
New York (Greater).....	740	17.4	538	12.8	564	12.7	Surface ponds and streams.
							The sources of supply for the different boroughs of Greater New York are as follows:
							Boroughs of Manhattan and the Bronx obtain their water from streams, lakes, ponds and reservoirs on the Croton, Bronx and Byram watersheds. Borough of Brooklyn, about 60 per cent of the water is underground water or is filtered through artificial filters; the remainder is surface water from streams and storage reservoirs. Borough of Queens water supply is underground water from driven wells. Borough of Richmond obtains underground water from wells.
Little Falls.....	1	8.8	3	25.9	1	8.6	Surface water from two different streams. (Filter abandoned.)
Onondaga.....	0	.....	2	19.8	0	0	Springs.
Cities using filtered surface water:							
Hornell.....	1	7.5	2	14.1	3	21.2	Surface water. Filtered since 1899. (Mechanical pressure filter.)
Hudson.....	1	9.4	2	18.1	1	9.1	Hudson river, filtered prior to February, 1905. Purer small streams filtered since then. (Slow sand filter.)
Kingston.....	7	27.0	6	22.9	8	30.6	Surface streams and Cooper lake, filtered. (Mechanical filter.)
Middletown.....	3	18.8	7	42.1	3	18.1	Surface water filtered. (Mechanical gravity and pressure filters.)
Mount Vernon.....	10	37.7	2	7.1	2	7.2	Surface water filtered. (Mechanical filter and sand strainer.)
Oneonta.....	2	23.8	6	68.2	7	76.6	Surface water filtered. (Mechanical pressure filters.)
Yonkers.....	8	11.9	7	9.6	5	6.9	Surface streams and storage reservoirs unfiltered; tube wells and Saratani river, which is filtered. (Slow sand filtration.)

THE EFFECTS OF WATER POLLUTION AS REFLECTED IN VITAL STATISTICS*

It is a well-known fact that every case of typhoid fever is caused by infection from a previous case of the disease. While it is true that it is often spread through the agencies of infected food, principally milk and vegetables, through personal contact and through other agencies than an infected water supply, it should be borne in mind that a contaminated water supply is, in general, the most common channel of typhoid fever transmission.

It may be said in general that typhoid fever, winter cholera and diarrhea are most prevalent along the water courses used in common for the disposal of sewage and as sources of public water supplies. This is clearly shown from the mortality from typhoid fever in the cities in this State located on the banks of the Mohawk, Hudson, Niagara and Oswego rivers. Other municipalities having polluted water supplies also show it through the prevalence of typhoid fever.

The most serious epidemic which has occurred in this State during the past ten years was in 1903 in the city of Ithaca, which resulted in the loss of fifty lives, representing a death rate of 357.0 per 100,000 population. The most serious outbreak of typhoid fever which occurred in the State during 1907 and 1908, due to a contaminated water supply, was in the village of Peekskill, where over 150 cases occurred resulting in 28 deaths.

Noted epidemics of typhoid fever due to infected water supplies have occurred in cities in States adjoining New York as follows:

Year	City	No. of cases reported	Deaths
1885.	Plymouth, Pa.....	1,104	114
1890-91.	Lowell, Mass.	550	132
1890-91.	Lawrence, Mass. ....	....	74
1892-93.	Lowell, Mass.	141	34

* Reprint of article prepared by the Director of the Division of the Vital Statistics for the Monthly Bulletin, January, 1910.

Year	City	No. of cases reported	Deaths
1892-93.	Lawrence, Mass.	141	32
1901.	New Haven, Conn.	514	73
1903.	Butler, Pa.	1,270	56
1903.	Cleveland, Ohio	3,443	472
1906.	Scranton, Pa.	1,155	111

The epidemics occurring in Lowell and Lawrence were due to the use of unfiltered water from the Merrimac river, into which was discharged the sewage from Lowell and other cities. In each instance the epidemic in Lawrence closely followed the outbreak in Lowell.

Returns at hand indicate that the death rate from typhoid fever in this State during 1909 was the lowest ever recorded — 15.0 per 100,000 population. The death rate in 1908 was 16.0. The average rate for the ten years preceding was 21.6. The urban death rate was higher than the rural by a fraction, but there is a steady decrease in the urban rate, especially in those cities active in seeing that their source of public water supply is properly protected from contamination. Statistics for 1909 are not yet complete and available for comparison with previous years.

The sources of public water supplies in this State may be classified as follows: Unfiltered lake water; unfiltered river water; filtered river water, well or spring water; streams and reservoirs.

It is a noticeable fact that in some instances our public water supplies are taken from those streams most grossly polluted, as will be seen from the following:

City	Source of water supply	Gross pollution of sources of supply
Cohoes.....	Mohawk river.....	Sewage discharged from several cities.
Dunkirk.....	Lake Erie.....	Sewage discharged from Dunkirk and Fredonia.
Lockport.....	Prior to 1909—Erie canal.	
Niagara Falls.....	Niagara river.....	Sewage discharged from Buffalo.
North Tonawanda.....	Niagara river.....	Sewage discharged from Buffalo.
Ogdensburg.....	Oswegatchie river.....	Sewage discharged from Gouverneur and other villages.
Oswego.....	Oswego river.....	Sewage discharged from Fulton, Syracuse and villages.
Tonawanda.....	Niagara river.....	Sewage discharged from Buffalo.
Watervliet.....	Mohawk river.....	Sewage discharged from several cities.

The average typhoid death rate in the cities, excepting Dunkirk, using unfiltered lake water during the past ten years was 23.9.

The average rate in cities using unfiltered river water during the same period was 56.7. The cities having the largest death rate were: Niagara Falls, 132.9; Cohoes, 84.4; Ogdensburg, 54.6; Oswego, 49.4; Lockport, 48.4.

The average typhoid death rate in cities using well and spring water was 34.3; streams and reservoirs, 26.6; and filtered surface waters, 27.8.

It is a generally accepted fact that a decided decrease in the mortality from typhoid fever in cities having a contaminated water supply usually follows the installation of a filtration plant, and that a similar decrease follows a change in the water supply from a polluted source to one less exposed to contamination. However, in some cities, the typhoid death rate has not decreased to the extent that would be expected, as will be noted by the mortality from typhoid fever in the cities of Rensselaer and Poughkeepsie using the grossly polluted water from the Hudson river. The average death rate from typhoid in Rensselaer during the ten years 1899-1908, was 61.9, and in 1908 it was 30.00. The ten-year average in Poughkeepsie was 46.5 and in 1908, 34.5.

The efficiency of the Albany filtration plant is shown from the fact that the ten-year average dropped from 88.8 before filtration was employed to 22.2 during the ten years since the filters have been installed, and in 1908, the rate was but 10.9 per 100,000.

In the city of Hudson, where the water supply has been changed (in 1905) from the Hudson river to purer small streams, the death rate from typhoid in 1908 was 18.1 as compared with an annual rate of 59.2 during the past ten years.

The death rate from typhoid fever in the city of Poughkeepsie in 1907 was 112.0. The filtration plant was improved in the fall of 1907, and in 1908 the death rate dropped to 34.5. Previous to 1907 the average annual death rate for eight years had been 39.8.

Owing to the inefficient type of the filtration plant in Watervliet, the typhoid death rate has averaged 57.5 during the past ten years.

It is therefore clear that the responsibility of purifying our public water supplies should not wholly be put on the filtration plants. Raw sewage must be removed from our streams used for public water supplies.

Efficient filtration is, however, the safest protection of water supplies against water-borne disease, as is clearly indicated by the great reduction in the mortality from typhoid fever in the following cities:

City	Average death rate from typhoid before improvement	After installation of filtration plants	Per cent. reduction in death rate
Ithaca	67.2	13.7	79.6
Albany	88.8	22.2	75.0
Binghamton	39.3	12.3	68.7
Watertown	94.7	37.4	60.5
Hudson	64.3	28.5	55.6
Rensselaer	95.5	44.2	53.7
Schenectady	25.0	13.7	45.1
Troy	58.2	32.3	44.5
Hornell	42.2	23.5	44.3
Elmira	54.9	36.1	39.7

The possibilities of a much greater reduction in the mortality from typhoid fever in most of the cities in the State is shown by the low death rate from typhoid fever in European countries. In the Annual Summary for 1908, published by the Registrar-General of England and Wales, the death rate from typhoid fever is given as follows: London, 5; Edinburg, 2; Glasgow, 8; Paris, 8; Rotterdam, 5; The Hague, 1; Copenhagen, 7; Stockholm, 1; Berlin, 4; Hamburg, 4; Dresden, 6; Breslau, 5; Munich, 3; Vienna, 4.

The dangers arising from the discharge of sewage into streams used for public water supplies are clearly reflected in the mortality statistics of the municipalities that use them; and it is therefore the duty of municipalities situated along the streams, first to

cease using their streams for sewage disposal purposes, unless sewage purification methods are employed, and secondly, to adopt means of water purification to further eliminate the danger arising from this contamination. The adoption of the first means, sewage purification, makes the second, or water purification, unnecessary or more easy of accomplishment and for this reason it is the first and prime duty of all municipalities to see that the streams are kept free from pollution or that the sewage is efficiently purified before being discharged therein.

Mortality from Diphtheria

The reported mortality from Diphtheria since 1885 and deaths per 100,000 population is shown by the following:

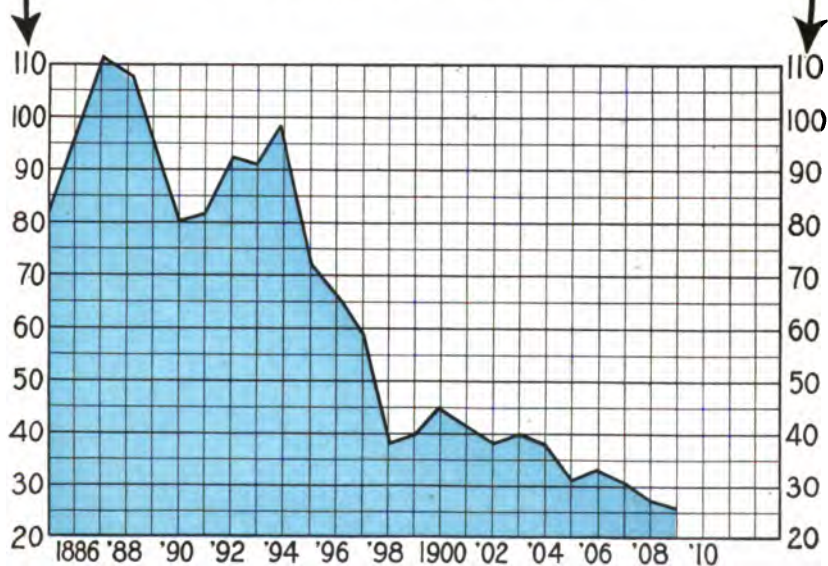
YEAR	Deaths from diphtheria	Deaths per 100,000 population due to diphtheria	YEAR	Deaths from diphtheria	Deaths per 100,000 population due to diphtheria
1885.....	4,508	80.3	1898.....	2,612	37.0
1886.....	5,597	97.8	1899.....	2,786	38.9
1887.....	6,490	111.3	1900.....	3,306	45.4
1888.....	6,448	108.4	1901.....	3,026	40.7
1889.....	5,885	96.9	1902.....	2,859	37.7
1890.....	4,915	79.5	1903.....	3,035	39.2
1891.....	5,072	80.3	1904.....	3,041	38.4
1892.....	5,918	91.9	1895.....	2,296	28.4
1893.....	5,947	91.0	1906.....	2,691	32.6
1894.....	6,592	99.3	1907.....	2,603	30.9
1895.....	4,989	74.0	1908.....	2,473	28.9
1896.....	4,597	67.1	1909.....	2,313	26.5
1897.....	4,115	59.2			

Deaths from Diphtheria per 100,000 population in the —

DISTRICTS	1900	1901	1902	1903	1904	1905	1906	1907	1908	1909
Maritime.....	63.7	55.3	52.6	54.6	51.3	37.5	43.5	39.7	38.8	37.0
Hudson Valley.....	37.5	33.7	25.1	19.4	23.2	21.1	22.9	31.6	21.6	14.4
Adirondack and Northern.....	18.7	23.3	11.4	14.1	16.0	10.2	16.3	16.2	12.7	7.6
Mohawk Valley.....	32.2	34.1	28.5	22.5	24.6	15.6	25.4	17.4	15.6	11.3
Southern Tier.....	26.8	18.5	27.9	17.2	23.5	16.1	13.7	20.0	14.1	15.8
East Central.....	15.2	15.8	10.8	12.2	14.8	8.6	10.5	15.2	19.1	10.0
West Central.....	22.1	8.8	10.4	12.6	15.2	11.7	8.4	15.0	10.9	7.8
Lake Ontario and Western.....	23.2	26.7	22.9	34.5	32.7	25.5	26.4	19.1	11.0	17.6
Entire State.....	45.4	40.7	37.7	39.2	38.4	28.4	32.6	30.9	28.9	26.6

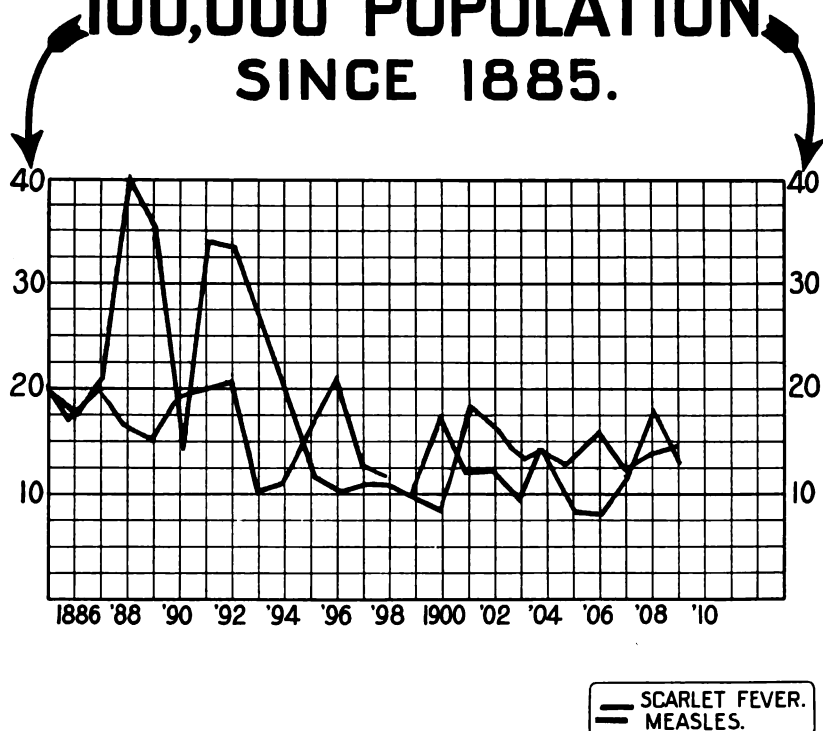
MORTALITY FROM DIPHTHERIA. DEATHS PER

100,000 POPULATION
SINCE 1885.



NEW YORK STATE DEPARTMENT OF HEALTH

MORTALITY FROM SCARLET FEVER AND MEASLES. DEATHS PER 100,000 POPULATION SINCE 1885.



NEW YORK STATE DEPARTMENT OF HEALTH

In each 1,000 deaths there were from Diphtheria in the —

DISTRICTS	1900	1901	1902	1903	1904	1905	1906	1907	1908	1909
Maritime.....	32	28	28	31	26	21	24	21	23	22
Hudson Valley.....	21	20	16	12	13	12	13	17	13	9
Adirondack and Northern.....	14	17	9	10	11	7	11	11	9	5
Mohawk Valley.....	20	22	20	16	15	11	15	10	10	7
Southern Tier.....	20	13	21	14	19	11	9	13	9	10
East Central.....	10	11	8	9	9	6	7	10	7	6
West Central.....	15	8	8	8	10	7	5	9	7	5
Lake Ontario and Western.....	16	18	17	22	22	17	17	12	12	12
Entire State.....	25	23	23	24	21	17	19	18	18	16

Scarlet Fever and Measles

The reported mortality from scarlet fever and measles, and deaths per 100,000 population is shown by the following:

YEAR	Deaths from scarlet fever	Deaths per 100,000 population from scarlet fever	YEAR	Deaths from measles	Deaths per 100,000 population from measles
1885.....	1,184	21.1	1885.....	1,170	20.8
1886.....	1,011	17.7	1886.....	895	15.6
1887.....	1,267	21.7	1887.....	1,205	20.7
1888.....	2,452	41.2	1888.....	944	15.9
1889.....	2,205	36.4	1889.....	899	14.8
1890.....	913	14.8	1890.....	1,181	18.8
1891.....	2,252	35.6	1891.....	1,200	19.0
1892.....	2,177	33.8	1892.....	1,350	20.9
1893.....	1,626	24.8	1893.....	789	12.1
1894.....	1,227	18.8	1894.....	900	13.5
1895.....	850	12.6	1895.....	1,266	18.8
1896.....	759	11.1	1896.....	1,495	21.8
1897.....	841	12.1	1897.....	873	12.6
1898.....	837	11.8	1898.....	838	11.8
1899.....	730	10.2	1899.....	756	10.5
1900.....	689	9.4	1900.....	1,333	18.3
1901.....	1,430	19.2	1901.....	859	11.6
1902.....	1,215	16.0	1902.....	929	12.2
1903.....	1,057	13.6	1903.....	721	9.3
1904.....	1,194	15.1	1904.....	1,170	14.8
1905.....	1,726	9.0	1905.....	988	12.2
1906.....	690	8.4	1906.....	1,369	16.6
1907.....	1,032	12.2	1907.....	967	11.8
1908.....	1,688	19.8	1908.....	1,175	13.7
1909.....	1,205	14.0	1909.....	1,272	15.0

In each 1,000 deaths there were from Scarlet Fever in the —

DISTRICTS	1900	1901	1902	1903	1904	1905	1906	1907	1908	1909
Maritime.....	6	15	13	10	11	6	6	9	17	10
Hudson Valley.....	4	7	5	7	3	4	1	3	5	3
Adirondack and Northern.....	4	6	6	4	5	2	2	1	2	1
Mohawk Valley.....	3	4	13	11	11	6	7	3	7	7
Southern Tier.....	5	3	5	5	9	3	1	3	2	3
East Central.....	3	5	2	2	6	9	4	3	2	5
West Central.....	3	2	1	1	1	2	2	3	2	3
Lake Ontario and Western.....	5	4	4	6	2	5	4	4	9	15
Entire State.....	5	11	11	8	8	5	5	7	12	9

In each 1,000 deaths there were from Measles in the —

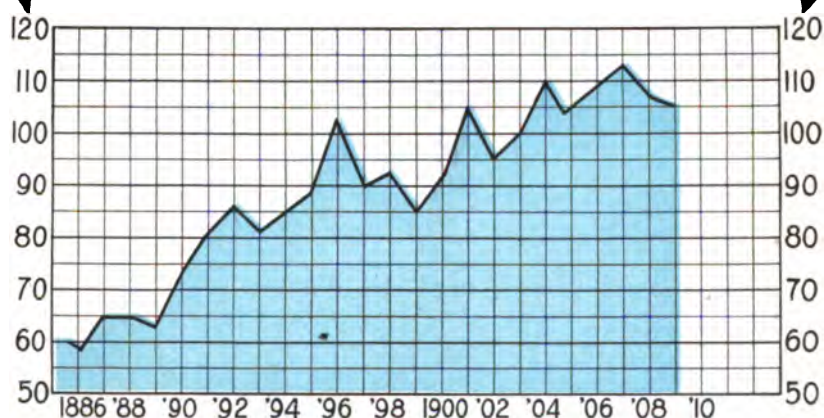
DISTRICTS	1900	1901	1902	1903	1904	1905	1906	1907	1908	1909
Maritime.....	11	6	10	7	11	7	14	8	13	13
Hudson Valley.....	10	5	2	3	8	9	5	4	3	4
Adirondack and Northern.....	9	15	5	3	1	11	3	2	1	4
Mohawk Valley.....	11	8	3	3	2	5	1	4	2	2
Southern Tier.....	6	5	5	2	9	2	1	4	2	2
East Central.....	8	13	2	5	4	4	3	1	4	6
West Central.....	5	6	3	3	3	4	3	2	2	1
Lake Ontario and Western.....	10	5	7	6	3	11	4	7	4	8
Entire State.....	10	6	8	9	10	8	10	7	8	9

Deaths from Violence

The reported mortality from Violence and deaths per 100,000 population due to accidents is shown by the following:

YEAR	Deaths from violence	Deaths per 100,000 population	YEAR	Deaths from violence	Deaths per 100,000 population
1885.....	2,994	53.3	1898.....	6,520	92.4
1886.....	3,296	57.6	1899.....	6,093	85.0
1887.....	3,780	64.7	1900.....	6,714	92.2
1888.....	3,842	64.6	1901.....	7,926	106.6
1889.....	3,834	63.2	1902.....	7,058	93.0
1890.....	4,542	73.4	1903.....	7,646	98.6
1891.....	5,028	79.6	1904.....	8,822	111.5
1892.....	5,543	86.1	1905.....	8,352	103.3
1893.....	5,295	80.9	1906.....	8,874	107.5
1894.....	5,487	82.7	1907.....	9,668	114.2
1895.....	5,889	87.3	1908.....	9,183	107.4
1896.....	7,022	102.6	1909.....	9,232	106.1
1897.....	6,172	88.7			

MORTALITY FROM VIOLENCE. DEATHS PER 100,000 POPULATION SINCE 1886.



NEW YORK STATE DEPARTMENT OF HEALTH

In each 1,000 deaths there were from Violence in the —

DISTRICTS	Decade, 1886-1894	Decade, 1896-1904	1905	1906	1907	1908	1909
Maritime.....	39.0	57.7	53.5	63.1	66.4	66.0	65.4
Hudson Valley.....	40.7	49.3	64.6	58.3	60.3	61.9	70.0
Adirondack and Northern.....	36.7	46.2	52.3	56.1	54.0	60.4	53.7
Mohawk Valley.....	43.5	53.1	58.8	60.9	61.5	60.4	68.4
Southern Tier.....	51.0	55.5	67.0	59.4	63.3	62.7	66.9
East Central.....	44.0	50.0	54.5	60.9	63.7	62.1	61.5
West Central.....	44.5	51.7	58.0	63.6	63.3	64.1	65.8
Lake Ontario and Western.....	48.5	57.0	66.2	74.2	71.2	68.1	73.4
Entire State.....	40.3	55.8	61.0	63.2	65.3	66.1	65.8

In each 1,000 deaths there were from Diarrhea in the —

DISTRICTS	1900	1901	1902	1903	1904	1905	1906	1907	1908	1909
Maritime.....	56	93	85	75	76	83	74	79	81	69
Hudson Valley.....	68	40	42	85	36	43	35	20	45	35
Adirondack and Northern.....	72	41	33	38	23	43	34	35	45	39
Mohawk Valley.....	65	41	44	35	40	41	44	47	53	50
Southern Tier.....	55	30	34	35	23	29	37	25	34	22
East Central.....	68	31	33	28	20	32	36	37	41	35
West Central.....	57	28	35	26	26	35	36	22	30	26
Lake Ontario and Western.....	86	60	56	50	53	50	57	46	52	45
Entire State.....	62	72	67	60	60	65	61	63	66	56

In each 1,000 deaths there were from Pneumonia in the —

DISTRICTS	1903	1904	1905	1906	1907	1908	1909
Maritime.....	89	110	125	137	78	64	70
Hudson Valley.....	70	78	75	79	77	65	70
Adirondack and Northern.....	57	60	66	74	81	60	71
Mohawk Valley.....	64	73	77	76	80	70	66
Southern Tier.....	55	70	70	60	71	61	60
East Central.....	64	83	75	61	66	56	70
West Central.....	60	72	70	65	65	57	56
Lake Ontario and Western.....	51	65	65	60	54	50	55
Entire State.....	80	95	104	109	75	63	67

In each 1,000 deaths there were from Bright's Disease in the—

DISTRICTS	1903	1904	1905	1906	1907	1908	1909
Maritime.....	67	65	71	71	63	60	67
Hudson Valley.....	57	62	62	62	66	72	77
Adirondack and Northern.....	40	50	50	45	53	52	58
Mohawk Valley.....	53	55	60	58	70	68	78
Southern Tier.....	40	53	52	55	66	69	71
East Central.....	48	56	58	53	63	68	71
West Central.....	35	55	58	44	63	65	71
Lake Ontario and Western.....	40	50	50	47	50	48	53
Entire State.....	60	62	65	64	62	61	67

As one of the representatives of the Department in attendance at the annual meeting of the American Public Health Association held in Richmond, Va., October 19-23, 1909, I respectfully submit the following:

I reached Richmond on the 20th inst., and attended meetings of the Section on Vital Statistics. Among the interesting papers presented at the meetings were: "Morbidity Statistics in the Matter of Insanity in Immigrants;" "The Characteristics of Naval Vital Statistics;" "The Ages of 500 Cases of Hookworm Disease and Frequency of the Disease in the Different Age Groups;" "Smallpox in the United States;" "Statistics of Duration of Life;" "Utilization of Municipal Vital Statistics;" "The Relation of Public Water Supplies to General and Specific Mortalities of Cities;" "The International Congress on Hygiene and Demography."

A revised standard certificate of death for use beginning January 1, 1910, which had been prepared by the U. S. Census Bureau, after conferring with the registration officials of the States comprising the registration area of the United States, was presented before the conference by Dr. Cressy L. Wilbur, chief statistician of the U. S. Census Bureau, and after discussion unanimously approved.

The new standard form having met with your approval, it was put in general use in this State January 1, 1910.

Respectfully submitted,

F. D. BEAGLE,

Director Division of Vital Statistics

ALBANY, N. Y., April 15, 1910.

SPECIAL REPORT ON VITAL STATISTICS

BY

Prof. Walter F. Willcox, Consulting Statistician

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SPECIAL REPORT ON

EUGENE H. PORTER, M. D., *State Commissioner of Health,*

SIR:— I have the honor to submit my third report as consult preparing it I have been aided at several points by advance
The following table shows the main statistical results of regis

TAB

Population, Births, Deaths, Stillbirths, Marriages

YEAR	Estimated population	Births, excluding stillbirths, according to State Department of Health	DEATHS, EXCLUDING STILL-BIRTHS, ACCORDING TO —		Stillbirths, according to State Department of Health
			State Department of Health	Census Bureau	
1885	5,609,910	63,536	80,407	.....	.....
1886	5,719,855	89,828	86,801	.....	.....
1887	5,831,947	102,038	108,269	.....	.....
1888	5,946,246	103,089	114,584	.....	.....
1889	6,062,764	114,804	113,155	.....	.....
1890	6,182,600	112,572	128,648	.....	.....
1891	6,316,333	125,909	129,850	.....	.....
1892	6,438,283	130,143	131,388	.....	.....
1893	6,537,716	136,297	129,659	.....	.....
1894	6,638,696	141,827	123,423	.....	.....
1895	6,741,246	142,311	128,834	.....	.....
1896	6,845,375	147,327	126,253	.....	.....
1897	6,951,111	144,631	118,525	.....	.....
1898	7,085,459	138,702	122,584	.....	.....
1899	7,167,491	136,778	121,831	.....	.....
1900	7,281,533	143,156	132,089	132,352	.....
1901	7,434,896	140,539	131,335	131,461	.....
1902	7,591,491	146,740	124,830	124,651	.....
1903	7,751,375	158,343	127,498	127,602	.....
1904	7,914,636	165,014	142,217	142,014	.....
1905	8,081,333	172,259	137,433	137,222	.....
1906	8,251,538	183,012	141,099	140,626	9,401
1907	8,425,333	196,020	147,130	146,882	10,261
1908	8,546,356	203,159	138,912	138,883	10,291
1909	8,706,039	202,656	140,261	140,073	10,069

VITAL STATISTICS

CORNELL UNIVERSITY, ITHACA, N. Y., August 1, 1910.

Albany, N. Y.:

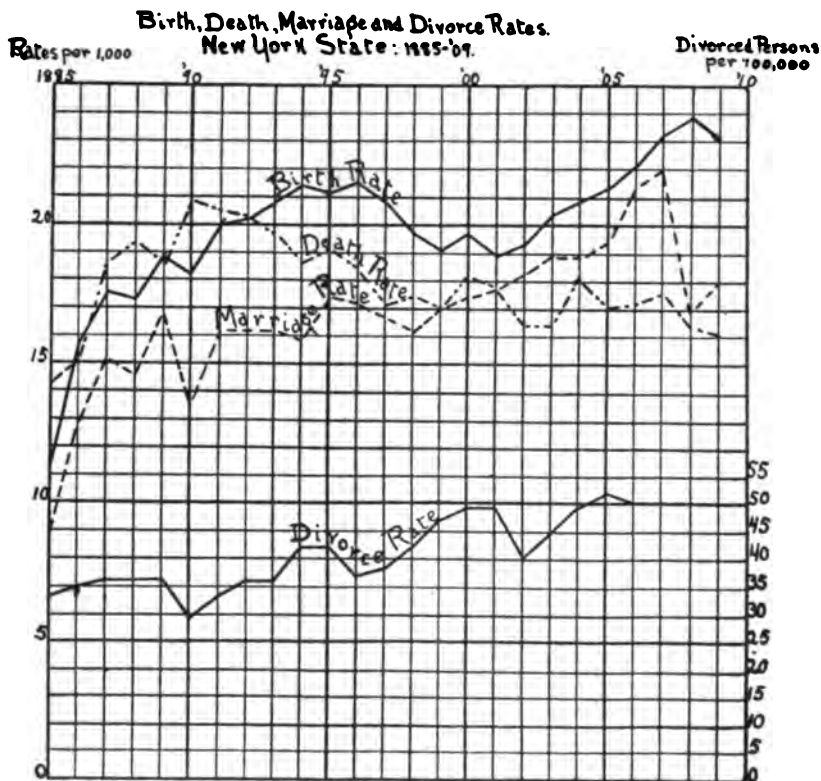
ing statistician upon the vital statistics of New York State. In figures kindly furnished me by the Bureau of the Census. tration in New York State since 1885.

LE I

and Divorces in New York State — 1885-1909

MARRIAGES, AC- CORDING TO —		Divorces, accord- ing to Census Bureau	Births per 1,000 popula- tion	Deaths per 1,000 popula- tion	Persons married per 1,000 popula- tion	Persons divorced per 100,000 popula- tion	YEAR
State Depart- ment of Health	Census Bureau						
24,409	.....	936	11.3	14.3	8.8	33	1885
36,764	.....	1,006	15.7	15.2	12.8	35	1886
44,438	44,542	1,042	17.5	18.6	15.2	36	1887
43,683	44,645	1,034	17.3	19.3	14.6	36	1888
50,960	49,997	1,095	18.8	18.6	16.8	36	1889
41,195	49,201	901	18.2	20.8	13.4	29	1890
51,458	51,277	1,052	19.9	20.5	16.2	33	1891
52,725	52,798	1,155	20.2	20.3	16.2	36	1892
52,805	52,999	1,175	20.8	19.7	16.2	36	1893
52,539	52,621	1,386	21.4	18.6	15.8	42	1894
59,059	58,889	1,434	21.1	19.1	17.4	42	1895
58,990	59,189	1,270	21.5	18.4	17.2	37	1896
57,530	57,025	1,324	20.8	17.1	16.6	38	1897
57,392	57,155	1,493	19.7	17.4	16.2	42	1898
61,167	59,907	1,690	19.1	17.0	17.0	47	1899
63,225	63,743	1,800	19.7	18.1	17.4	49	1900
65,216	65,158	1,832	18.9	17.7	17.6	49	1901
68,903	69,439	1,533	19.3	16.4	18.2	40	1902
73,011	73,338	1,774	20.4	16.4	18.8	44	1903
74,677	74,581	1,952	20.8	18.0	18.8	49	1904
78,261	80,162	2,144	21.3	17.0	19.4	52	1905
87,870	88,979	2,069	22.2	17.1	21.4	50	1906
95,216	.....	.....	23.3	17.5	22.0	.....	1907
72,286	.....	.....	23.8	16.3	16.9	.....	1908
78,363	.....	.....	23.3	16.1	18.0	.....	1909

The general trend of the changes are more clearly indicated by the accompanying diagram.



The deaths reported for the entire State in 1909 numbered 140,261, a smaller total than in 1904, 1906 or 1907, but larger than for any other of the twenty-five years since 1885 when the records began. Inasmuch as the population of the State is steadily increasing, the deaths would also increase whether they bore an increasing, an unchanging or even a slightly decreasing ratio to the population. The absolute number of deaths in an increasing population decreases only when the decrease in the ratio of deaths more than counterbalances the increase of population.

Probably before this report is printed the population of New York State, April 15, 1910, will be made public by the Bureau of the Census and, with the help of that information, the population in the middle of the year 1909 can be estimated with reasonable accuracy. Until then a provisional estimate by a method explained in the last report must be used. This indicates a population of 8,706,039. Accepting this estimate, the death rate or average number of deaths to 1,000 persons in 1909 is 140,261 divided by 8,706,039, or 16.1. The computed death rate of the State has not been so low for twenty-three years and probably the computed death rates in 1885 (14.3) and 1886 (15.2) were much below the true rates because in those first two years of registration many deaths were not recorded. If that be true, the year 1909 stands at the high water mark of public health in the history of New York State. If the death rate in 1909 had been the same that it was in 1890, namely 20.8, the number of deaths in the State last year would have been 181,086 instead of 140,261. In other words, the decline of the death rate in the course of nineteen years represents an annual saving of the lives of 41,303 persons. Or it may be stated thus: In an average group of 10,000 persons living under the New York conditions of 1890 there were forty-eight more deaths annually than in an average group living under the New York conditions of 1909. It has been estimated* that "for every fatal case of illness there are from four to five more cases which end in recovery." If that be correct the saving of 41,303 lives annually means a saving in a single year of between 150,000 and 200,000 cases of serious illness.

Whether the conditions in this State last year were exceptional or whether it merely shared with other States of the registration area in the blessings of an unusually healthy season can not be determined until the records for other States become available for comparison. In order to determine the position of New York State among the rapidly increasing number of registration

* Registrar-General's Report for 1881, p. xvi.

States the following table has been compiled from the reports of the Bureau of the Census.* The States are arranged in the order of decreasing mortality or increasing healthfulness.

States in Order of Decreasing Death Rate

1901-1905	1906	1907	1908
Rhode Island. 17.8	Rhode Island.. 17.5	California..... 18.6	California..... 18.4
New York... 17.1	California..... 17.4	Rhode Island. 18.0	Colorado..... 17.0
Massachusetts 16.6	New Hamp- shire..... 17.3	Colorado..... 17.6	Massachusetts.. 16.5
New Hamp- shire..... 16.4	New York.... 17.1	Massachusetts. 17.5	New Hamp- shire..... 16.3
Vermont..... 16.2	Vermont..... 16.8	New York.... 17.5	New York.... 16.3
New Jersey... 16.1	Connecticut... 16.7	Connecticut... 17.1	Rhode Island.. 16.2
Connecticut.. 16.0	Massachusetts. 16.6	New Hamp- shire..... 17.1	Maine..... 16.0
Maine..... 16.0	Pennsylvania. 16.5	Maine..... 16.6	Vermont..... 16.0
Michigan..... 13.3	Maine..... 16.2	New Jersey... 16.6	Pennsylvania... 15.7
Indiana..... 13.0	New Jersey... 16.2	Pennsylvania. 16.5	Maryland..... 15.5
	Colorado..... 15.9	Vermont..... 16.2	Connecticut... 15.4
	Maryland..... 15.7	Maryland..... 16.1	New Jersey... 15.4
	Michigan..... 14.3	Michigan..... 13.9	Washington... 14.8
	Indiana..... 12.5	Indiana..... 12.5	Michigan..... 13.8
	South Dakota. 8.8	South Dakota. 9.8	Indiana..... 12.3
			Wisconsin.... 11.6
			South Dakota.. 10.1

The table shows that in comparison with the other States of the registration area the death rate of New York State is a high one. Its position has been as high as second and never lower than fifth among the ten to seventeen registration States. Part of this may be due to a completeness in the records of deaths in New York State greater than that of several others in the lists, but there is little doubt that the death rate is relatively high.

A comparison with past conditions in this State thus brings encouraging evidence of rapid progress and a comparison with the present condition of other communities confirms the unanimous testimony of all students of preventive medicine that much further progress may reasonably be anticipated and striven towards.

Urban and Rural Classification

For the ten years 1900-1909 we have the death rates in New York State classified as urban and rural, the division being drawn

* Mortality Statistics 1908, p. 24.

at incorporated places of at least 8,000 inhabitants. The following table shows the results:

DEATH RATE OF NEW YORK STATE

YEAR	In urban districts	In rural districts	Excess in urban districts
1900	19.5	15.5	4.0
1901	18.8	15.3	3.5
1902	17.6	13.9	3.7
1903	17.4	14.4	3.0
1904	19.2	15.2	4.0
1905	17.8	15.2	2.6
1906	18.0	14.8	3.2
1907	18.3	15.6	2.7
1908	16.7	15.2	1.5
1909	16.3	15.3	1.0
Decrease 1900-1909	3.2	0.2	

The decline in the death rate has been almost confined to the urban districts. The real decline in the rural districts may have been masked by an improvement in the completeness of registration, but there is little doubt that the actual difference in the healthfulness of city and country has been rapidly dwindling as a result in large part of improved urban sanitation.

Sex Classification

A table in my last annual report (page 241) gives the deaths in New York State classified by sex for each year between 1900 and 1908 inclusive. That table showed a slight increase in the proportion of male deaths and a decrease in the proportion of female deaths. This might be due merely to an increase in the proportion of males in the population. Whether such an increase has occurred we shall soon know. But probably a contributing and perhaps the sole cause is found in a decrease of the female death rate more rapid than the decrease in the male death rate. For example, the deaths of males in 1909 exceeded those in 1908 by 775 or 1.04 per cent., while the deaths of females in 1909 exceeded those in 1908 by only 415 or 0.65 per cent.

Age Classification

The total deaths in 1909 were more numerous than in 1908, but the deaths at ages between 5 and 35 were less numerous. Those at ages above 35 with minor exceptions were more numerous. This disproportionate increase in the deaths of elderly persons is another evidence of the increasing average duration of life.

Race Classification

The following figures show the number of deaths in New York State in each of the last three years classified as white and colored. The colored include Negroes, Indians and Mongolians.

Deaths in New York State among

YEAR	Whites	Colored
1907	143,414	3,468
1908	135,456	3,427
1909	136,944	3,317

The deaths among whites and colored were fewer in 1909 than in 1907. In each year the deaths among colored were 2.4 per cent. as many as those among whites, a fact indicating either that there has been little change in the racial composition of the population and the relative death rates of the races, or that a change in one has been counterbalanced by an opposite change in the other.

I incorporate in this report a discussion of the death rate from tuberculosis and its decrease which has already appeared in the Monthly Bulletin.

Death Rate from Tuberculosis

It is often argued that the decrease in the number of deaths or the death rate from tuberculosis is a proof and measure of progress in the campaign against "the white plague." This argument neglects the fact that the general death rate is decreasing. To show that the campaign against tuberculosis is having its effect, it should be found that the deaths, or the death rates, from that disease are decreasing faster than the average for all

other causes. A test of that question is enlightening. As the estimates of population and so the rates computed from them are somewhat doubtful, attention has been confined to the total number of deaths. In each case the number of deaths in 1900 has been taken as 100 per cent. and the ratio of the deaths in each following year to that number has been found. The following figures give the results for New York State as a whole, New York city and the rest of the State:

YEAR	NEW YORK STATE		NEW YORK CITY		REST OF STATE	
	Tuber- culosis, all forms	All other causes	Tuber- culosis, all forms	All other causes	Tuber- culosis, all forms	All other causes
1900.....	100	100	100	100	100	100
1901.....	101	99	99	100	104	98
1902.....	93	94	94	96	92	92
1903.....	98	96	99	95	96	97
1904.....	104	108	105	112	103	104
1905.....	103	104	102	104	103	104
1906.....	106	106	109	108	102	105
1907.....	107	112	109	112	104	111
1908.....	107	105	108	102	105	107

Apparently in this State the increase in deaths from tuberculosis has just about kept pace with the increase from all other causes of death. In some years it was smaller and in others larger. The same seems to be true for New York city and for the rest of the State. The result is apparently a negative one. No influence of the special campaign against tuberculosis can be traced in the figures.

One complicating element, however, must be kept in mind. Perhaps a significant proportion of the deaths from tuberculosis are credited to some other cause. Perhaps this proportion has been decreasing and figures for tuberculosis have been getting nearer the truth. If this be so, the change may be important enough to hide completely the influence of the antituberculosis campaign. All that can now be said is that no evidence of the influence of that campaign appears clearly in the figures for the State.

How is it elsewhere? For the other registration States whose records are extensive enough to warrant any conclusion, the following gives the results for 1908 compared with 1900, 100 per cent. representing again the number of deaths in each case in 1900. If the figures for each intervening year were included, the indications would not differ materially.

STATE	Tuberculosis, all forms 1908	Other causes 1908
Connecticut	94	98
Indiana	96	95
Maine	88	93
Massachusetts	90	102
Michigan	105	108
New Hampshire	81	95
New Jersey	111	93
Rhode Island	107	93
Vermont	88	100

The condition in Michigan is similar to that in New York. In Indiana the number of deaths in each instance has decreased, but apparently the proportion of those from tuberculosis to all other causes has not. In New Jersey and Rhode Island, while the mortality from other causes has been decreasing, that from tuberculosis has been increasing, so that the comparative proportion of the latter has risen. Only for five of the New England States may we conclude from the figures that the deaths from tuberculosis are declining more than those from other causes.

Since the preceding section was written the figures for New York State in 1909 have become available and their evidence is somewhat more favorable. Death rates for the State are not computed and used because the estimates of population for years so

far from a census enumeration are unsafe. Hence, the number of deaths only will be considered. Taking the figures for 1900 in each class as 100 per cent., the ratios of deaths from all forms of tuberculosis and of deaths from all other causes in the State as a whole, in New York city and the rest of the State in 1909 are as follows:

NEW YORK STATE		NEW YORK CITY		REST OF STATE	
Tuberculosis, all forms	Other causes	Tuberculosis, all forms	Other causes	Tuberculosis, all forms	Other causes
103	106	106	104	100	108

These figures indicate that in the State as a whole and especially in the State outside the metropolis the deaths from tuberculosis are beginning to show a less increase than those from all other causes, and hence that during the last year the death rate from tuberculosis has decreased more than the general death rate. However, if the figures above are compared with those presented in the preceding section, considerable fluctuation between 1900 and 1909 will be noted, so that a persistent trend in the figures is not apparent. Thus far the study suggests that we are just at the point where significant results from the anti-tuberculosis fight are beginning to appear.

In order to find whether there is any basis for the suggestion that a real downward trend in the tuberculosis figures may be masked by an improved diagnosis, bringing deaths into that class which formerly would have been charged to other causes, a study has been made of the deaths from each form of tuberculosis. Attention was directed first to the two classes "tuberculosis of the lungs" and "all other forms." The following table indicates the per cent. that each of these formed of the total deaths from tuberculosis in the States which were included in the registration area

in 1900, in New York State as a whole, in New York city and in the rest of the State.

YEAR	REGISTRATION STATES, 1900		NEW YORK STATE		NEW YORK CITY		REST OF STATE	
	Tuber- culosis, lungs	Other forms	Tuber- culosis, lungs	Other forms	Tuber- culosis, lungs	Other forms	Tuber- culosis, lungs	Other forms
1900.....	89.1	10.9	89.2	10.8	88.5	11.5	90.2	9.8
1901.....	88.4	11.6	88.5	11.5	87.6	12.5	90.0	10.0
1902.....	87.7	12.3	87.5	12.5	86.4	13.6	89.2	10.8
1903.....	87.0	13.0	87.1	12.9	86.3	13.7	88.5	11.5
1904.....	87.3	12.7	87.8	12.2	87.1	12.9	88.9	11.1
1905.....	86.4	13.6	87.8	12.2	87.8	12.2	87.8	12.2
1906.....	86.1	13.9	87.4	12.6	87.4	12.6	87.3	12.7
1907.....	85.9	14.1	86.4	13.6	87.1	12.9	85.5	14.5
1908.....	85.0	15.0	86.2	13.8	86.7	13.3	85.4	14.6
1909.....	84.8	15.2	86.9	13.1	87.2	12.8	86.3	13.7

The significance of the above figures becomes clearer when the results are stated using the number of deaths in 1900 in each class as 100 per cent., as has been done in the following table:

YEAR	REGISTRATION STATES, 1900		NEW YORK STATE		NEW YORK CITY		REST OF STATE	
	Tuber- culosis of lungs	Other forms	Tuber- culosis of lungs	Other forms	Tuber- culosis of lungs	Other forms	Tuber- culosis of lungs	Other forms
1900.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1901.....	98.2	105.6	99.7	107.4	97.6	107.5	103.3	107.2
1902.....	90.9	104.3	91.1	108.2	91.5	111.5	90.6	102.3
1903.....	93.3	113.8	95.2	116.5	96.1	118.0	93.9	113.9
1904.....	101.2	120.7	102.3	117.8	103.1	117.9	101.2	117.5
1905.....	97.8	126.0	100.9	116.4	101.6	109.2	100.0	129.4
1906.....	98.1	130.0	103.9	124.2	107.3	119.4	98.6	132.9
1907.....	98.8	132.5	103.6	134.6	107.1	122.8	98.4	155.7
1908.....	96.3	139.3	103.2	137.0	106.1	125.4	99.1	157.7
1909.....	94.6	138.7	100.4	125.9	103.9	117.6	95.2	140.9

The conclusion is very clear that forms of tuberculosis other than pulmonary have constituted a constantly increasing portion of the total deaths from tuberculosis during the decade. While this might be due merely to an actual increase in the number of deaths from these minor forms greater than the increase in the number of deaths from all kinds, yet a more probable hypothesis is that an improved diagnosis has been bringing a constantly increasing number of deaths into the less common forms. One fact

that points to the correctness of this theory is that the proportion which deaths from tuberculosis other than that of the lungs forms to the total deaths from all forms has changed much less in New York city than in the rest of the State. There is little doubt that greater advance in accuracy has occurred in the State outside the metropolis than in it, because both medical knowledge and accuracy in registration statistics were already greater in the city.

By reference to the following table for New York State, it is possible to see in what special minor forms of tuberculosis the increases have been greatest. The figures for 1900 are again used as 100 per cent.

Various Forms of Tuberculosis — New York State

YEAR	Tuber- culosis of lungs	Tuber- culosis of larynx	Tuber- culosis menin- gitis	Abdom- inal tuber- culosis	Pott's dis- ease	Tuber- culous abscess*	White swell- ing*	Tuber- culosis of other organs	General tuber- culosis
1900.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1901.....	99.9	143.8	99.7	110.4	95.0	150.0	90.9	126.5	129.1
1902.....	91.1	132.6	105.9	105.7	120.0	75.0	110.9	122.1	99.3
1903.....	85.2	140.4	110.9	108.3	119.0	175.0	107.3	161.8	132.6
1904.....	102.3	139.3	104.1	120.2	138.0	75.0	112.7	170.6	148.2
1905.....	100.9	131.5	101.1	125.0	137.0	187.5	129.1	183.8	125.5
1906.....	103.9	113.5	118.4	129.5	136.0	50.0	140.0	160.3	127.0
1907.....	103.6	169.7	123.2	125.6	145.0	225.0	136.4	211.8	154.6
1908.....	103.2	151.7	169.3	128.0	159.0	162.5	132.7	202.9	141.8
1909.....	100.4	140.4	126.2	115.8	91.0	337.5	74.5	239.7	117.0

* The mortality from these two forms is comparatively slight and, especially in the case of tuberculous abscess, fluctuates greatly, so that these figures are of insignificant value.

Tuberculous meningitis and abdominal tuberculosis each destroys larger numbers than any other minor forms; the above table shows that material increases have occurred in the number of deaths from these two. Even more striking increases are shown in the figures for tuberculosis of the larynx, tuberculosis of other organs and general tuberculosis. The corresponding figures for the states which were included in the registration area in 1900 shows the same tendency.

The most important truth which this study should impress is that the "anti-tuberculosis campaign" is not in reality a campaign at all, but a war, a war which undoubtedly will require years of hard fighting; and that signs of victory must not be ex-

pected to become apparent at once. Instead of discouraging those engaged in the fight, the comprehension of this truth should stir to redoubled activity. Only when we are entirely undeceived as to the character of a war, do we put forth the effort necessary to win.

In my first report an effort was made to determine the annual economic loss from tuberculosis.* So much interest has been manifested in this subject and so much has been written about it since that date that it seems wise to return to the question and consider what progress the discussion has made in two years, explain, if possible, the wide divergencies between the results of different authorities and indicate what is the best method of dealing with it, what are the most trustworthy assumptions to which to apply that method, and what are the most probable results.

It might be clearer if the phrase used in the discussion were not economic loss but monetary loss, that is, the loss which can be estimated and expressed in money. There are many forms of loss from tuberculosis not susceptible of measurement in this way. Most of them, like the suffering of patients and their friends, cannot be measured at all. One of them, the years of probable life cut off by premature death, can be measured more accurately than the monetary loss and is perhaps a better test of the community's loss than any statement in terms of millions of dollars. Still, neither one of these excludes the other and each has its advantages.

Let me assume the case of a man with a wife and family who dies from tuberculosis at the age of thirty and ask how is the economic loss from the death to be estimated:

a. Is the loss of earnings during the period of his illness an element?

b. Is the added cost of maintenance during his illness an element?

c. Is the amount of his annual earnings just before he fell ill an element?

d. Is the amount of money spent upon his rearing until the age at which he became self-supporting an element?

* See State Dept. of Health. 28 Annual Report: pp. 231-246 and Sixth International Congress on Tuberculosis, Vol. I, pp. 37-45.

e. Is the excess of his earnings over the cost of his own maintenance during his period of self-support an element?

f. Is the probable duration of subsequent life of an average man at the age of thirty an element?

g. Is the amount of probable future earnings but for the premature death an element?

h. Is the amount of his probable future earnings but for the death to be diminished by the probable cost of his future maintenance?

i. Is the added value of his product over what it costs in materials, wages and miscellaneous or incidental expenses to produce it an element?

All students agree that the loss of earnings, added cost of maintenance during the sickness and the amount of annual earnings are elements. They differ regarding the propriety of including the cost of rearing or of production. The first efforts in this country to deal with the question, by Dr. Biggs and Dr. Thomas, included it, but in all the more recent examinations of the subject (Hoffman, Price, Glover, Fisher, Willcox) this element of loss is omitted. No students include both the cost of the man's production and also his future earning power. The choice is between one and the other. On the average and in the long run a man, like any other agency of production, must pay for himself, that is, he must earn enough money to cover the cost of the investment which he represents. When any material thing of value but not an agency of production is destroyed, for example, a house is burned down, the only available measure of the economic loss sustained, is the cost of building or producing the house or that cost minus its deterioration in value between its building and its destruction. But when the thing destroyed is an agency of production, like a mill, the measure of loss might be the cost of rebuilding the mill or the loss of the mill's future earnings during its probable life time. Clearly it could not be the sum of these.

All authorities agree in regarding *a*, *b* and *c* in the preceding list as elements in the problem and in making *d* and *e* on the one hand and *f* and *g* on the other alternatives, either pair of which

is to be accepted but not both. All recent writers agree in preferring f and g to d and e as elements.

All recent writers on the subject, except Professor Fisher, agree that the amount of probable future earnings but for the death should be diminished by the probable cost of future maintenance. He declines to do so because this method implies that the death of a dependent is an economic gain. In this respect I cannot agree with him.

Mr. Hoffman draws a distinction between the economic loss and the social loss. The social loss, he thinks, is the future earnings, minus cost of maintenance. The economic loss is measured by the added value of his product. This distinction likewise I cannot accept.

The points of agreement regarding the proper method are now far more numerous and important than the differences. But the latter are not to be ignored and the question arises, is there any means of reaching an agreement upon these points also?

Writers in this field have not hitherto noticed that very similar questions frequently come before the courts. I digress to consider the legal treatment of these questions in the hope it may aid in settling the divergencies which have been mentioned.

Let me suppose that one person is accidentally killed as a result of culpable negligence on the part of another person or a corporation. Have any survivors a right to bring an action and recover damages for the death? Under the old common law of England and the United States no such right was recognized. Thus, in 1886, a suit was brought in a circuit court of the United States against the steamer Harrisburg in the name of the widow and child of a person killed in a collision due to the negligence of those in charge of the steamer. The lower court awarded damages against the steamer to the amount of \$5,100, but the Supreme Court of the United States reversed the decision on the ground that no right of action existed in such cases independent of statute and that no statute applied to the case at bar.

This old rule of the English and American common law was first changed in England by Lord Campbell's Act, passed in 1846 (9 and 10 Victoria, chapter 93), and since that date imitated more or less closely in nearly all American states. The principle

of this act is very simple. It is merely that the death of an individual should no longer terminate the right of action. Under the earlier law a person maimed or injured by such an accident had a right to sue, but if he died, the right to sue died also. Lord Campbell's Act kept the right alive in such cases, vested it in the "wife, husband, parent and child" and allowed the jury to give "such damages as they may think proportioned to the injury resulting from such death to the parties respectively for whom and for whose benefit such action shall be brought."

As already stated this statute has been imitated in most American states. In cases falling under it the measure of damages is the economic loss caused by the death. The New York statute provides that the damages may be such as the jury or, if there be no jury, the court or the referee "deems to be a fair and just compensation for the pecuniary injuries resulting from the decedent's death to the person or persons for whose benefit the action is brought." The New Hampshire statute is more specific and allows the "probable duration of his life but for the injury and his capacity to earn money" to be considered as elements of damage. The practice in the other States conforms to this specific provision of the New Hampshire law. From an examination of awards which have been made by juries under these statutes and upheld on appeal by the higher courts certain principles may be derived.

a. No excessive or punitive damages can be imposed as an indirect punishment of the person or corporation responsible for the death. (A few States are exceptions.)

b. Damages cannot be increased as a means of solacing the grief of survivors.

c. Damages are not to be reduced proportionately in cases where the deceased held a life insurance policy.

d. In computing the amount of damage standard life tables are admissible as evidence.

e. The damage is measured by the probable amount of the future earnings over and above what would be needed for the person's support; in other words, the test of probable future earnings rather than that of cost of production is applied.

Thus in the second edition of Sedgwick on Damages, published in 1908, the following rule is laid down (page 180):

"In the case of the death of the head of the family, the measure of damages is governed by so much of what the deceased would have probably earned by his labor or have accumulated during the residue of his life * * * as would probably have gone to the benefit of his family, taking into consideration his habits of living, his age, and his ability and disposition to labor and benefit them." This rule agrees in the main with the position taken by most recent writers on the subject of economic loss.

The legal rule just quoted clearly shows that the cost of future maintenance should be subtracted from the probable future earnings in order to measure the damage. Most of such cases are suits for damages caused by accidental deaths wherein the impaired earnings and increased cost of maintenance during sickness are minor elements of the problem or entirely lacking. But there is no doubt that if present they would be included in the amount of the award.

Some writers on economic loss have considered only deaths among males or males of money earning age, others have included wage-earning women, still others have considered all adults, and another group have extended the estimate to include deaths among children. On this point of difference also the decisions of the courts are helpful.

Members of the family can recover for the death of a wife and mother not engaged in any strictly money earning occupation. Thus in Pennsylvania the award of \$9,150 as damages for the death of a farmer's wife shown by the evidence to be characterized by "frugality, industry, usefulness, attention and tender solicitude of a wife and the mother of children" was upheld on appeal, and in California the award of \$14,000 in a case where "the wife was highly educated and competent to instruct the children and was a devoted mother and wife and an excellent housekeeper" was treated in the same way.

Regarding the measure of damage for the death of a minor child there is one important difference between the legal and what I conceive to be the economic point of view. The law gives damages for the value of the child's probable future services, minus

the probable cost of maintenance, only during his minority. This is closely connected with the practice in most States refusing damages to a parent for the death of a child who has attained majority unless the child since reaching that age has actually assisted the parents. The loss to society from such a death may be much greater than the loss to the parents. Under the legal rule it would seem that the damages recoverable by a parent for the death of a single woman who had just attained her majority would be nominal, but if she were married the damages recoverable by her husband might amount to thousands of dollars. In this particular I believe that the economic loss should not be determined by the rule followed in the courts. The reason for the legal rule is clear, namely, that there is no person entitled to receive the damage and that society cannot sue and recover as an individual. This reason has no application to the economic problem.

Regarding the method of computing the economic loss from the death of a husband and father or wife and mother I find a substantial agreement between the decisions of the courts and the opinions of the majority of economic writers. That loss is the sum of three elements; (1) the excess of probable future earnings over cost of future maintenance, (2) the decrease of earnings and (3) the increase in cost of maintenance during the period of sickness. This agreement is due to the fact that the economic loss to society and the money loss to the family are substantially identical. But students of the economic problem apply the same method to all children and to adults who have no persons partly or entirely dependent upon them and for that reason entitled to sue in court. If at some time in the future a city or village shall be held responsible at law for the ill effects of an epidemic of small pox or typhoid fever due to the incapacity or negligence of its health officers, as it may now be held responsible for accidents due to defective streets or sidewalks, the damages would be assessed in such a way as is here outlined.

The three papers on this subject read at the International Congress on Tuberculosis by Professor Fisher, Professor Glover and the present writer, all followed this method, but Professor

Fisher preferred to make no allowance for the cost of future maintenance. If this were subtracted, as I think it should be, his figure of \$1,100,000,000 as the annual loss from tuberculosis in the United States, the only basis I know for the common statement that the loss is over one billion dollars, falls to half that or less, and below our estimate of \$650,000,000.

Why Professor Glover, employing the same method as ours, reached a result of \$42,000,000, which is less than one-fifteenth as large, still remains for explanation. Against the mathematical side of his paper no serious objection is raised. But several of the statistical assumptions to which his method is applied seem to me faulty. This sum of \$42,000,000 purports to be the amount which if paid each year to the personal representatives of those who died from tuberculosis in the United States and put out at interest by them would yield a total equal to what the deceased would have earned during their probable after lifetime over and above their own cost of maintenance. But what rate of interest shall be accepted? Professor Glover assumed 5 per cent. I doubt that the average investor of trust funds for the purpose of providing a livelihood for widows and orphans can safely count on more than $3\frac{1}{2}$ per cent. If Professor Glover had made the same assumption his \$42,000,000 would have been raised to \$55,000,000.

Again he has used the death rate from tuberculosis of the lungs for the whole country, in about two-thirds of which, as explained later, the death records were vitiated by omissions so numerous as to make them almost valueless. We used the death rate of New York State for tuberculosis of all forms. If the death rate in the United States from tuberculosis in 1900 was as high as that in New York State in 1907, and I think it was probably higher, the \$55,000,000 to which Professor Glover's figures have already been raised would become about \$79,000,000.

A solution of the problem requires that the surplus of average earnings over cost of maintenance be known. Professor Glover, without assigning any reason assumed that this surplus is \$100 for each male between 20 and 70 years of age. Basing ourselves upon the returns of the Twelfth Census, we assumed that it is \$300 for each year between twenty and sixty-five. If he accepted

our assumption on this point, it would raise his figures still further to \$240,000,000.

He neglected also deaths at ages below twenty and above sixty. According to our results to allow for such deaths would increase his figures by 14 per cent., or bring them up to \$270,000,000. Neither did he make any estimate of the money value of deaths among women. We have assumed that the net prospective earnings of a woman are one-half those of a man of like age, and given reasons. If this assumption were accepted it would raise his figures by about 42 per cent., or to \$383,000,000.

Professor Glover made no allowance for the reduction of earnings and the increased cost of maintenance during illness. Our figures estimated this at about one-fifth of the lost future earnings. Introducing this element brings his figures to \$460,000,000. We estimated also the loss from bovine tuberculosis in New York State as between 2 and 3 per cent. of the loss from human tuberculosis.

The most serious flaw in the assumptions to which he has applied the method is found in his hasty acceptance of the deaths recorded in the Twelfth Census for the entire country as a basis for his computations. Those results are derived from two widely different sources, the records of deaths made in states and cities having an approximately accurate registration of deaths, and those made in states or parts of states which had no such system. In the latter each enumerator was instructed to ask of each family, Has any death occurred in this family within the last twelve months? That method was introduced in 1850 and followed persistently for six censuses. Experience has proved that not more than seven-tenths, and probably not more than two-thirds of all the deaths which occur can be secured upon a record obtained in such a manner. It has now been discarded. The mortality tables constructed from these returns of the Twelfth Census are so wide of the truth as to have little, if any, application to the real problem.

The life tables prepared by insurance companies from their own experience are somewhat better, but labor under a different defect. The insured are a select class, living longer and suffering less from disease, especially tuberculosis, than the mass of the

population. The only American life table for a large unselected population yet in existence is the one we have used, the Massachusetts life table derived from the deaths in that State for 1893-97 and the population enumerated in 1895.

It seems clear, then, that the wide differences in the results of the three papers read before the International Congress on Tuberculosis at Washington in 1908 do not prove that there is a fatal or even a wide difference in method. The method they all use agrees in the main with that followed by the courts, and when applied to the best data obtainable, it shows that the annual economic loss from tuberculosis of all forms in the United States is not very far from \$500,000,000.

At one point the assumptions to which our method was applied in 1908 seem open to improvement on revision. We estimated the average earnings of adult women as one-half those of adult men. The figures of the Twelfth Census indicate that this is approximately true of gross earnings. But we are concerned here with net earnings, or gross earnings minus cost of maintenance. Even if the gross earnings of women be one-half those of men, the cost of a woman's maintenance is more than one-half that of a man's. It is usual to estimate it as four-fifths. A correction made for this change of assumption would reduce our estimate from \$650,000,000 to \$550,000,000 and an omission of the estimated loss in New York State from bovine tuberculosis, as resting upon very insecure foundations and not applicable without great modification to the country as a whole, brings it still lower to \$535,000,000.

With these changes the results of the three papers for the annual economic loss from tuberculosis agree reasonably well and corroborate rather than condemn each other. That loss, as already stated, is not far from \$500,000,000.

Respectfully submitted,

WALTER F. WILLCOX,
Consulting Statistician

DIVISION OF COMMUNICABLE DISEASES

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DIVISION OF COMMUNICABLE DISEASES

ALBANY, N. Y., *April 1, 1910.*

EUGENE H. PORTER, M. D., *State Commissioner of Health,
Albany, N. Y.:*

DEAR SIR:— I have the honor to herewith transmit the report covering the work of the Division of Communicable Diseases during the year 1909, the same having been compiled with the able assistance of Dr. F. C. Curtis, Consulting Dermatologist of the Department.

Very respectfully,

WILLIAM A. HOWE, M. D.

Director

The following diseases have been designated by the State Commissioner of Health, under the law, for report to the Department by health officers, monthly or in the case of some of them more frequently or as they occur: Tuberculosis, diphtheria, scarlet fever, measles, typhoid fever, cerebrospinal meningitis, smallpox, ophthalmia neonatorum. Reports from every municipality have been received during 1909 except seven, which have by their failure made themselves sufficiently conspicuous for mention, viz.: the towns of Watertown, Jefferson county; Monroe, Orange county; Piermont, Rockland county; Orange, Schuyler county; Cohocton, Fremont and Tusten, Sullivan county. Otherwise reports, some of them with lapses of a few months, have been received from all of the 1,422 municipalities. There has been almost a unanimous response from the health officers, some of them it must be said as a result of much urgency from this division. But the Department has been favored with the very general co-operation of the health officers all through the State.

The result has been to secure the report, for 1909, of 138,315 cases of these diseases. In 1908 the number so reported was

144,580; in 1907, during part of which year less than one-fourth of the towns reported, the number was 26,351. The numbers given for these last two years include those from New York city as well as the rest of the State.

It cannot, however, be claimed that these reports are complete. The evidence of this will be referred to later, but it is often made a matter of complaint by health officers that they cannot induce physicians and citizens to report communicable diseases to them, unmindful of the authority vested in local boards of health to adopt regulations requiring this and to enforce obedience by penalties which will not only secure the desired end but establish respect for these administrative officers.

The incidence, by months, of reported cases is shown by the following table:

CASES OF COMMUNICABLE DISEASES REPORTED DURING 1909

	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Tuberculosis.....	3,739	2,352	3,097	3,015	2,671	2,755	2,638	2,529	2,604	2,276	2,943	2,308
Diphtheria.....	2,406	2,032	2,118	1,594	1,591	1,893	1,126	916	1,291	1,421	2,299	1,952
Scarlet fever.....	2,696	2,517	3,175	2,475	2,253	1,883	724	608	754	1,150	1,962	2,543
Measles.....	4,366	4,701	6,870	7,053	7,033	8,153	2,696	1,031	688	1,160	3,257	5,790
Typhoid fever.....	515	341	389	258	361	333	474	851	1,880	1,120	867	506
Cerebro-spinal meningitis.....	27	44	56	45	42	42	34	33	45	46	30	19
Ophthalmia neonatorum.....	7	3	5	1	5	4	7	2	2	7	0	5
Smallpox.....	63	72	32	33	411	25	16	12	2	7	29	53

TUBERCULOSIS

From this disease there were reported as existing in the State during 1909, 32,887 cases. This is an average of 2,740 new cases every month. The foregoing table shows how little deviation from this average were reported each month. It is an average of 90 new cases daily through the year.

The report of tuberculosis is a matter of recent time. To secure full reports is involved in difficulty. The law requiring its report was enacted in 1908. In 1907 there were 22,100 cases reported; in 1908 the number of cases was 26,635. There was an increase

last year in the registered number of 16 per cent.; this year there is a further increase of 20 per cent. over the year before. In the State there were 6,252 more cases placed on record in 1909 than in 1908.

The metropolitan cities of New York and Buffalo in 1907 reported 20,000 cases; in 1908 the number was increased to 24,000; in 1909 the number is 27,067. In the State outside the two cities there were reported in 1907, 2,100 cases; in 1908, 2,635 cases; in 1909, 5,820 cases.

Those increments are respectively in a metropolitan population of nearly 5,000,000, and a non-metropolitan and rural population of nearly 4,000,000. In the former more exact returns are expected. The reports this year outside the large cities are more than double those of the year before, which indicates the more perfect effect being secured under the tuberculosis law.

In 1908 in New York city the number of deaths from pulmonary tuberculosis was to the number of reported cases as 1:2.6; in 1909 there were fewer deaths and more cases reported for the year, and the proportion is as 1:3. For the rest of the State, in 1908 there were more deaths than reported cases; in 1909 the reported cases have increased to exceed the mortality in the proportion of 1:1.3. The showing is for better returns in the State at large, but it is apparent that tuberculosis is not fully reported. If the proportion of reported cases to deaths in the city had been obtained in the rest of the State there would have been a record of 16,500 cases for the year instead of 6,900.

The betterment in reports as the registration law is coming into effect is more manifest in the cities, where earlier response would be expected. In the cities of Buffalo, Rochester, Syracuse, Albany, Troy, Utica, Yonkers and Schenectady there were reported in 1908, 1,528; this year 2,677. In 1908 there were 1,632 deaths in these cities — more deaths than reported cases for the year. In 1909 there were 1,609 deaths and 2,677 reported cases, or a proportion of 1:1.7. But there is a disproportion among them in reporting. In Buffalo, Albany, Troy, Yonkers there were about two reported cases to one death, in Rochester and Utica fewer cases than deaths were reported.

Deductions cannot be drawn from these figures. The operation of the law is new and many cases now coming to registry are old cases, which will be eliminated from the reports of succeeding years; moreover it is evident from the unevenness of the records of localities that imperfect returns are yet made by many municipalities. If the law were in full operation the number of cases reported would be the number of new or newly discovered cases for the year. The deaths reported for the year would for the most part be of cases reported in previous years. In the early operation of the registry law, which to many localities is only now coming into execution, the reports will include not only incipient cases but those advanced and of years of duration. Therefore, the cases reported represent more nearly a report of the total of existing cases of tuberculosis than the number developing during the year. But the figures furnish no basis for estimating the average duration of sickness of tuberculosis, aside from the lack of record of recovered cases.

The law makes it the duty of physicians to report within twenty-four hours after the fact comes to their knowledge the name and address with other data of all cases of tuberculosis. Provision is made for the report of the death or removal of persons having tuberculosis, and on notification of removal a record is kept of the place removed to and this is sent to the Department of Health. Recovered cases are likewise to be reported. A register is kept of all cases by local health officers, but it is not open to public inspection. To secure a record of all cases of tuberculosis is a long step toward its control and by the increasing degree to which after two years this law is being brought into operation is the work of control of tuberculosis expedited.

There were 13,948 deaths from pulmonary tuberculosis in 1909. The average of the five years preceding was 14,200. There were fewer deaths this year than in either of the five preceding. In twenty-five years 330,000 deaths are recorded from this disease, the number in their order for successive five year periods being 59,567; 66,694; 65,564; 67,291; 70,783. In the first decade, estimating the population at 6,000,000, there were 210 deaths yearly per 100,000 population; in the last decade,

estimating the population at 8,000,000, there were 175. This year there are 160 deaths per 100,000 population.

New York city this year has 195 deaths per 100,000 population; the rest of the cities have 130; the rural part of the State, 120.

The deaths from consumption per 100,000 population in the Sanitary Districts are:

YEAR	Maritime	Hudson Valley	Adirondack	Mohawk Valley	Southern Tier	East Central	West Central	Western
1909.....	190	161	130	125	80	120	103	120
1908.....	205	172	138	133	96	125	113	116

In each 100 deaths from all causes there were from consumption:

YEAR	Maritime	Hudson Valley	Adirondack	Mohawk Valley	Southern Tier	East Central	West Central	Western
1909.....	11.4	9.6	8.8	8.3	5.2	7.8	7.0	8.0
1908.....	12.0	10.0	9.5	8.0	6.0	7.7	7.0	8.0
Av'ge, '99-'08..	11.6	10.4	9.7	8.5	6.9	8.5	7.5	8.3

From every point of comparison, not only in recent time, but in all the years of records kept by this Department, the Southern Tier District is uniformly the one showing the greatest freedom from pulmonary tuberculosis; the Maritime District has the highest, its death rate as well as its relative mortality being just double that of the district lowest in the scale of prevalence and mortality from this cause. The distribution of the disease as shown by its reported mortality, now as likewise in former years, indicates its greatest prevalence in urban populations and the comparative freedom of rural areas from it.

The seasonal prevalence of tuberculosis is not very significant; its fatality is more pronounced in the inclement seasons of the year, and when pneumonia and especially influenza are prevalent.

Tuberculosis Mortality by Months

	1908			1909		
	Urban	Rural	Total	Urban	Rural	Total
January.....	1,009	222	1,231	970	199	1,169
February.....	1,074	245	1,319	921	231	1,152
March.....	1,082	292	1,374	1,082	280	1,362
April.....	1,066	327	1,395	1,134	264	1,398
May.....	998	251	1,249	987	269	1,256
June.....	901	226	1,127	914	223	1,137
July.....	925	226	1,151	903	223	1,126
August.....	853	216	1,069	832	204	1,036
September.....	865	224	1,089	753	203	956
October.....	853	231	1,084	842	245	1,087
November.....	876	225	1,101	874	209	1,083
December.....	910	219	1,129	953	233	1,186

Tuberculosis, other than pulmonary, caused 2,112 deaths, as follows, and for the two years prior:

	1907	1908	1909
Tuberculosis of larynx.....	153	111	125
Tuberculous meningitis	1,055	1,128	1,111
Abdominal tuberculosis	405	421	389
Pott's disease	114	129	91
Tuberculous abscess	35	22	27
White swelling	39	39	41
Tuberculosis of other organs.....	160	162	163
General tuberculosis	200	185	165
Totals	2,161	2,197	2,112

The evidence of decrease in pulmonary tuberculosis, not notable in tuberculosis of other parts of the body, may to some degree be attributed to the general war of defense that is being set up everywhere against this disease, which although as yet largely initial, may be seen it is fair to say already bearing fruit. If the rate of mortality of the last decade had prevailed in 1909, there would have been 1,300 more deaths this year; if that of twenty years ago, instead of 14,000 deaths there would have been 17,500.

As to the schoolroom as a factor in tuberculosis, in one instance the community was much stirred up over the permission of a boy to attend public school whose father had advanced tuberculosis and was very indifferent in his habits. An exceedingly reckless subject might perhaps infect all his surroundings, but the chance of tuberculous infection at second hand must be remote.

The question of permitting teachers or pupils who have tuberculosis of the lungs to attend school is a different one and has been answered in the negative.

In the United States census report for 1908 the ratio of deaths from consumption in 1,000 deaths from all cases was:

Of males engaged in all occupations.....	150
Of male school teachers	138
Of females engaged in all occupations.....	210
Of female school teachers	211

This is a better showing for the occupation of school teacher than that reported in the Transactions of the International Congress of School Hygiene, London, 1907, which gives a ratio for male teachers of 184 against 154 for males of all occupations, and 256 for female teachers, against 215 for all occupations.

In the correspondence of the year is this letter, which shows the educational value of tuberculosis leaflets distributed among the people, a point of view prevalent among its subjects, and the potentialities of indifference: "I got at the State Fair a little booklet entitled 'Hope.' My husband employs a tinsmith who has consumption. He is a man who thinks it is no worse for others to have the disease than for him. He boards at the same hotel we do, uses the general cuspidors which are emptied on one end of the celery bed, and spits everywhere out of doors. This man knows he has consumption but says and acts as though he does not care how much he spreads the disease. He is a good workman and if he were compelled to use the necessary precaution I believe he would not be dangerous." The right attitude toward the consumptive has been learned by this correspondent.

With the information obtained measures were taken to protect the public health in the case.

Emphasis is laid in the tuberculosis law upon the disinfection of premises after removal or death of an occupant having had tuberculosis. Very likely house infection plays a small part compared with direct infection from the tuberculous subject "who coughs in the faces of others or in talking showers them with sputum," but observations have shown that the infection left behind, especially in domiciles otherwise unhygienic, is not to be neglected. The health officer must see that disinfection has been satisfactorily done.

Question as to the provision for indigent subjects of tuberculosis, especially when he is the bread-winner for the family, is often met. Fortunately this is being met by the law of 1909, introduced by Dr. Wood, Chairman of the Committee on Public Health of the Assembly, which placed in the hands of the State Commissioner of Health the power to determine the location of hospitals or camps for the treatment of pulmonary tuberculosis. Such hospitals are being provided by county or voluntary action, where a place is found for incipient or advanced cases, which furnish a chance for cure of the one or relieve the community of the risk of infection from the other. Registration which discloses cases, sputum examinations which determined the diagnosis, the great work of voluntary associations, and the providing of tuberculosis hospitals, have been effective during 1909 toward the control of this chief cause of long illness and mortality.

Diphtheria

The cases of diphtheria reported in 1909 were 20,659 in number, just 100 less than in 1908. Of this number 16,052 came from New York city. The number of deaths in the State was 2,306, which is 162 less than in 1908; in the city 1,715, or 50 less than 1908. Of the 2,306 deaths, 99 were returned as from croup.

In the metropolis diphtheria caused 2.3 per cent. of all the deaths; in Buffalo, 1.6 per cent.; in other cities an average of 1 per cent., Yonkers, Binghamton and Jamestown showing an

excess; the total urban diphtheria mortality was 2 per cent. of the deaths from all causes; the urban diphtheria mortality was 0.6 per cent. of the total.

In 1898 there was an abrupt decrease in the mortality for diphtheria. Prior to that time 71,000 deaths had occurred in thirteen years, an average yearly of 5,465, with no year less than 4,500 and some years exceeding 6,500, and an average of more than 80 deaths a year per 100,000 population. In 1898 the number of deaths fell to 2,600, has not since exceeded 3,300 and the average yearly mortality has been 2,750, a rate of 35 deaths per 100,000 population. The saving has been effected mostly through the use of diphtheria antitoxin. The entire series of twenty-five years, over which our records extend, reaches back just to the time of the discovery and publication of the Klebs-Löffler bacillus. Midway of that period comes the sudden decrease in mortality, commencing, indeed, in 1895, which had 1,600 fewer deaths than in 1894, with further moderate decrease for the succeeding two years, and then the abrupt drop in 1898 of 1,500 from the preceding year, and the low rate since maintained. Antitoxin serum as a remedy for diphtheria was published about 1893; its gradual acceptance followed to such degree as to affect the mortality of 1895, 1896 and 1897 moderately, and in 1898 its use was becoming general. In 1901 the law was enacted which authorized a State Antitoxin Laboratory under the direction of the State Department of Health, since which time, with a liberal use of the serum made possible by its free distribution, the mortality has been from 3,000 to the low rate of this past year of 2,300, which is indeed the lowest mortality yet attained; one of 26 deaths per 100,000 population. It is doubtless true that diphtheria is generally more benign than it formerly was, and part of the reduction in mortality may be due to this. In New York city the number of deaths was 11 per cent. of the number of reported cases, while in the rest of the State the percentage was 13. This may be interpreted as due to a possible freer and speedier use of antitoxin because of its greater accessibility, but on the other hand may be due to a less complete return of cases. All health officers in the State are required to keep on hand a supply of antitoxin for immediate use in any emergency,

and there need be no long delay in securing it anywhere. Its liberal use is always urged for the sick, and likewise its use to immunize the well who have been exposed is impressed upon health officers. It is the nearest analogue to the beneficent agent for the prevention of smallpox that has yet been given to us. Along with it we have the aid in recent years of the laboratory diagnosis, and it is the rule of the Department that quarantine shall be maintained until not less than two cultures taken with due precaution with at least a day interval have been found negative. Some prolonged germ cases have existed during the year. It is desirable that we know more as to the continued virility of the bacilli in such cases, though it is found that it is truly maintained often for an indefinite period. Doubtless some outbreaks have developed or been prolonged by them. That these "germ cases" carry virile bacteria is biologically proven; their continued isolation is therefore necessary, hardship though it be. That generally these bacteria are harbored long is to a considerable degree due to conditions of the tonsils or pharynx which can be remedied to the betterment of the health of the subject, and this along with energetic germicidal treatment will soonest enable the health officer to release them from quarantine without risk to the public. Antitoxin has no influence on the growth and multiplication of the disease germ.

Questions on various subjects connected with diphtheria come for reply. What authority has the health officer in cases of suspected diphtheria where there is refusal to allow cultures to be taken? He has the right to quarantine any such suspicious case until satisfied that it is not infectious.

Where the carpet is left on the floor of a room in which one having diphtheria has been quarantined, what disposal shall be made of it? The carpet should have been removed at the outset as it is especially likely to collect infectious matter and is difficult to clean, but having been left it should remain on the floor until after fumigation, and then taken to a remote place and cleaned by beating when the wind is in a favorable direction and subjected to prolonged exposure to the air and sun.

The board of health of a neighboring State reports that physicians of this State have failed to report cases occurring in one of

its municipalities to the local health officer. Such physicians are amenable to the laws of that State and can be proceeded against under them; they are notified of the gravity of this offense and informed that they must answer for it to the authorities where it was committed.

A school was closed on account of prevalence of diphtheria for two weeks and the rooms fumigated; a few days after opening again new cases appeared in different rooms, no pupils from quarantined houses having been admitted; propose to again close the school and repair the plumbing, which is thought to be at fault and the cause of the fresh cases. Answer. Long experience shows that bad plumbing is seldom the cause for continuance of diphtheria contagion; it is found that the real cause in almost every case of prolonged epidemics is individual contagion and usually to be traced to inefficient measures of quarantine. Frequently it is prolonged by persons in apparent perfect health carrying virulent diphtheria germs, and particularly where patients who have had diphtheria are discharged without rigid bacteriological control. The circulars set forth the necessity of insisting on repeated examinations to prove the absence of diphtheria bacilli before release from quarantine. Antitoxin assures the avoidance of mortality and the immunizing of those exposed, but does not eliminate the persistence of contagion. To successfully cope with an epidemic no one carrying diphtheria germs should be allowed at liberty. Other ways of prolonging epidemics have a place in literature, but personal communication is the chief one to be considered.

On the strength of two negative cultures taken at one-day intervals an individual within a week after onset was released from quarantine, who had clinical symptoms of diphtheria, including nasal as well as faucial membranous deposit, and further there was a case of diphtheria in the vicinity. Suggested: Such a case should never be released from quarantine on evidence like this. It is always unwise to disregard the clinical evidence of diagnosis; several negative cultures even taken with due precautions have been followed by subsequent positive cultures. When the clinical evidence is clear or even suspicious a quarantine should be main-

tained in spite of laboratory returns. Moreover no case of diphtheria should be released from quarantine within a week, or within two or three weeks, whether showing germ free cultures or not.

The health officer of Syracuse, Dr. D. M. Totman, reports on the efficiency of the "Telltale System" in use in his department in tracing an outbreak of diphtheria to a milk supply. Within four days in April sixteen cases occurred and with succeeding days a total of thirty-five on one milk route and among those supplied with milk from one dairy. Nasal diphtheria was discovered in the dairyman who milked the cows and had charge of the farm. Between January and March eight cases of diphtheria were traced directly to this dairy, and in a previous epidemic, in December, 1907, all the families affected took milk from it. Two Indians from the Onondaga Reservation were found at the farm at the time of investigation and one of them developed diphtheria and communicated it to others on the Reservation, making a total of fifty cases traceable to this source during 1909. The farm was reported to be in bad sanitary condition.

Is a health officer justified in treating as diphtheria and causing premises to be disinfected in the cause of death after four days' illness being certified to by the attending physician as follicular tonsillitis, there having been membranous deposit and cough of croup with obstructive respiration, other cases of sore throat existing in the vicinity? It is advised in such a case to require a private funeral, to disinfect and to have cultures from the throats of suspicious vicinity subjects.

There was no prolonged institutional prevalence of diphtheria, such as existed a few years ago in the Willard State Hospital. There were several cases found at midsummer in the Binghamton State Hospital, and cultures subsequently showed the presence of Klebs-Löffler bacillus in the throats of all in the building affected, both patients and employees, although only three or four showed any constitutional disturbance. Immunizing antitoxin in doses of one thousand to three thousand units had been given to all.

There was also diphtheria during the winter in the State Hospital for the Care of Crippled and Deformed Children at West Haverstraw, also at the State Industrial School at Industry and the State Reformatory at Elmira.

Scarlet Fever

There were 22,740 reported cases of scarlet fever, 13,000 from New York city. In 1909 there were 31,893, with 24,426 from New York city.

In the city there was one death to 16.5 cases; outside the city there was one death to twenty-three cases reported. Last year the number of deaths in the city to reported cases was one to nineteen; in the rest of the State, one to twenty-one. For the entire State the mortality to morbidity was the same for both years, viz.: one to nineteen.

In 1908 there were twenty deaths per 100,000 population; in 1909 there were fourteen. The mortality for scarlet fever in 1908 has not been equalled since 1892, when and for four years prior the number of deaths exceeded 2,000. For the last fifteen years the average yearly mortality has been less than 1,000. For periods of from two to six years there is a low death rate from scarlet fever, to be followed by periods of four or more years of excess. Since 1885 the number of deaths per 100,000 population has ranged from eight to forty-one. For many years there has been no approach to the mortality that prevailed from 1888 to 1893. For the past twenty-five years there has been an average yearly mortality from scarlet fever of 18.5 per 100,000 population.

The decrease from last year has been in the eastern part of the State, largely in New York city. In the western and southern there has been an actual increase. The urban mortality is diminished, the rural is unchanged. The total urban mortality from scarlet fever was 1,905, or 17 per 100,000 population, against 25 in 1908; the rural was 109, or 5 per 100,000 population, the same as in 1908.

In the six months of winter and spring 9,225 of the 13,000 cases were reported, and 800 of the 1,200 deaths occurred.

The difficulty in diagnosis of mild cases has continued during the year and has been the subject of correspondence and investigation. In diagnosis emphasis has been laid on one sudden onset; two early sore throat; three enlargement of glands, not only of the neck but general; four eruption (often evanescent and in one or two cases absent) as to its orderly onset, locality and evolution.

School teachers and parents are warned especially to watch for sudden illness attended with vomiting and sore throat extending over the pharynx and soft palate. But a toxic rash may be attended with similar symptoms.

Dr. Fletcher of Freeport reports a case of pronounced scarlet fever occurring in April and again in December in the same subject; this is least likely of the eruptive fever to occur the second time.

There has been a confusion of the diagnosis between scarlet fever and roetheln and the latter has been without doubt prevalent in numerous epidemics in the west-central part of the State. Sometimes it has been regarded as scarlet fever. The diagnosis of "Fourth Disease" has been made in one epidemic, but we have seen nothing to confirm this as an entity entitled to a separate name or a distinct disease. There are no cases where those subject to this have previously had scarlet fever. Difficulty is met in securing the report by physicians of cases of communicable disease. It is held by this Department that by every means possible a spirit of co-operation shall exist between the health authorities and medical men and there be no undeviating officialism observed in the relations with them in the work of protecting the public health which physicians generally assume as their own special obligation. But some physicians have very lax habits regarding this matter and the health authorities receive advice to, after full and fair notice, cite such to appear before the Board to show cause why the penalty for neglect of its regulations shall not be imposed.

Long-lasting epidemics of scarlet fever have occurred and have been from time to time investigated. The disease has in certain cases existed in the spring and continued till close of the schools, and returned as they reopened in the fall. The reasons for this have been too short a period of quarantine, existence of mild cases that escaped discovery and quarantine, and insufficient disinfection. No one can say with certainty how long infection continues nor just when it ends, but it certainly continues through the active period of the disease and as long as there is lesion of mucous surfaces, especially that of discharge from the ear; the period of desquamation serves to measure pretty well the quaran-

tine period unless it is over-prolonged, although the scales themselves are not essentially infectious. There appears more reason to believe that while scarlet fever is mostly a contact disease its infection has an almost unlimited vitality on material from about the sick and failure to destroy this has been the chief reason for persistence and recurrence, as so often occurs at the fall opening of schools, when such material is brought out and exposure occurs. To secure and control the first case is the surest way to prevent an epidemic.

As stated in a report by Dr. Curtis of an investigation of a prolonged outbreak at Granville, to which the health officer had given sedulous attention at personal sacrifice: "The lack of co-operation of the people makes the control of an epidemic of mild scarlet fever difficult. Sometimes and too often the physicians have been slow to recognize and report cases. The public is also lax in meeting its legal duty to declare cases. It is my personal belief that scarlet fever is one of the most difficult diseases to diagnosticate absolutely when it is very mild. But, when it is prevalent, every young person taken abruptly ill with a fever and rapid pulse along with sore throat, followed (and possibly not followed, for I have seen instances where it was altogether lacking which were nevertheless scarlet fever) by even the slightest redness and eruption on the chest and face, should be regarded as having scarlet fever and isolated immediately, especially as they communicate the disease from its earliest commencement. It does not require medical skill to recognize these symptoms, and every citizen ought to help the health board by declaring the existence of such and isolating them. I would advise the board to publish this as a regulation and require parents to report such cases and to enforce it by a fixed penalty. The people have ignored the board and I would advise that it let them know that legal powers are vested in it by the law. Then as to disinfection of the premises, this had better be done after the formula of our disinfection leaflet. Formaldehyde candles may be effective but they are certainly no better than the less expensive permanganate method of generating formaldehyde, which this disease requires the free and thorough use of. It is a common experience that articles of clothing or things in drawers and boxes escape disin-

fection and the infection lingers on them a long time. This scarlet fever virus is long lived and it takes the most scrupulous care to reach every infected thing where quarantine is maintained in a dwelling, whereby from lack of it some neglected infection comes to light from a preceding spring and starts the disease afresh as cool weather and the school assemblage brings it into operation. It would be an investment in the interest of economy for every village to have an inexpensive contagious disease hospital, for it is easy to see that when the time lost by quarantined families and all the other expense of a prolonged epidemic is computed the cost of it is not inconsiderable."

An interesting instance of the difficulty of completely disinfecting a dwelling after scarlet fever was brought under the observation of the Department during the year. After fatal scarlet fever the owner of the house, after its fumigation, removed the wall paper from all the walls, repainted the woodwork and had the floors washed with disinfectant. The house remained unoccupied for six months when another family with small children moved in, and three weeks after one was taken with scarlet fever. This time the floors were painted and the disease then stopped. In another instance two coats of oil were applied to the floor with similar sequence. It is easy to see that the cracks in a floor may readily catch and harbor this long lived infectious matter.

An epidemic traced to milk infection was investigated and reported on by Dr. Frederick J. Mann. The evidence was based on the occurrence of the bulk of the cases on the route of one of four milkmen and the scanty but apparently conclusive evidence of scarlet fever having existed in the dairyman who handled the milk. Milk-borne epidemics of scarlet fever are to be regarded, however, as very infrequent.

Closing of schools and sometimes of churches and other places of assemblage as a measure for the control of an outbreak of scarlet fever has been resorted to frequently during the year, and has been the subject of discussion and sometimes of protest. It has been held by the Department that it should be used as a last resort, warranted only by extensive prevalence of the disease and to be continued for as short a period as possible. It may sometimes be wise to suspend a school for a few days. But it is a

serious thing to interfere with the orderly working of these institutions in a community. One can hardly imagine its ever being done in a city or large village. It appears to have been too readily resorted to by boards of health in the more rural localities, and it is a question how far their action may be sustained by the courts if it is brought before them. As a general rule the children in a community can be better watched if they are assembled, for thus by daily inspection mild cases can be detected which would otherwise be overlooked, and closure of the school does not prevent their mingling on the street. In the lack of medical inspectors, teachers can be instructed to make a personal investigation every morning and if they detect any with signs of fever and sore throats or any indisposition that is suspicious or learn of suspicious illness in the family of attending pupils, such can be dismissed and the health officer notified. Better would be a daily medical inspection during the active period of an epidemic. In this way better track can be kept of an outbreak than would be possible if all children are at large, and their daily assemblage may be used as a means for handling it. The only risk that an undetected case may cause exposure may by exacting care be mostly obviated. The same can be done with the youthful part of a church congregation; the adults will hardly enter into the question. To secure every case and isolate it and subsequently to destroy the infection manufactured by it is the plain proposition for the control of scarlet fever, and not embargo the community in its established institutions. It is nevertheless true that, at least as a last resort or a temporary expedient, it comes within the powers and duties of a board of health to prohibit as has been done all under a certain age from attending any school, church or place of public amusement for a stated period, and to close the same by a special regulation.

A question raised by more than one health officer and perhaps entertained by others is one as to his professional relation to a suspected communicable disease. As put by one, is it the duty of a health officer at the request of an attending physician to visit and give an opinion as to the diagnosis of the case? Or, as another asks, must the diagnosis of an attending physician be accepted as final; and further, shall he determine when the case should be re-

leased from quarantine and perhaps take charge of the disinfection of the premises. The responsibility for protecting the public from contagious disease is on the health officer. If a physician suspects a patient in his care to have such disease his responsibility ends with a report of it to the health officer, whose judgment must be in a sense final, always giving due weight to the opinion of his professional associates, but giving the benefit of any doubt to the public, whom it is his duty to protect. He is responsible officially for the quarantine since he alone can impose it, and for the directions necessary for its maintenance; and he ought to see that the disinfection of the premises after recovery is carried out. Nor need this conflict with customary professional ethics.

MEASLES

There were 53,000 cases of measles reported, double the number of scarlet fever cases and equal to the combined reports of scarlet fever, diphtheria and typhoid fever. But it is quite certain that there actually were a good many that escaped a formal record or ever came to the notice of local health authorities. New York city reported 32,000. March, April, May and June were the months in which most cases were reported and most deaths occurred, and the fewest in September and October.

In 1908 there were 59,000 cases of measles reported and 1,175 deaths; in 1909, 53,000 cases and 1,270 deaths. The average yearly mortality for twenty-five years is 1,062 and the range of actual mortality has been from 721 to 1,369.

To compare measles mortality with scarlet fever mortality for the earlier and later parts of this period of twenty-five years:

Mortality by Five-Year Periods from Scarlet Fever and Measles

	1885-9	1890-4	1895-9	1900-4	1905-9
Measles.....	5,113	5,400	5,228	5,012	5,800
Scarlet fever.....	8,119	8,195	4,017	5,585	5,340

Apparently influences are at work which are lessening the mortality from scarlet fever, a disease which may be almost

classed with the septic or pyogenic; it is at least of later time not the large contributor to the death rate that it formerly was. But measles is just as prevalent and as fatal as it was years ago, in the early part of this series of years which covers the time of practical knowledge of bacteriology applied to the communicable diseases. There have been more deaths from it during the last five years than in any other five-year period. There have also been more deaths during this period from measles than from scarlet fever. There were more deaths in 1909 from measles than from scarlet fever.

The city mortality from measles for the year was 18.2; the rural, 4.7 per 100,000 population. The average city mortality for the preceding five years was 16.0 per 100,000 population, with a range from 14.0 to 19.1. The average for rural districts for the same period was 6.4 deaths per 100,000 population with a range from 4.8 to 8.7. Scarlet fever for the same period had an average urban mortality per 100,000 population of 17.2, and a rural of 4.8.

The age at death incidence of measles taken from the last U. S. Census Reports is an average of 4.2 years, that of males being a little under this and of females a little over. The median age, that is the age which has an equal number of decedents above and below it, is 1.8 years. The only diseases having a lower average age incidence at death are whooping cough and croup. The young therefore should be protected from exposure to measles.

Deaths from pneumonia, meningitis and the like immediately sequent to measles are recorded as deaths from measles. How far pulmonary tuberculosis from which death is more remote is set up through measles there is no statistical record of value, but the catarrhal condition attending measles, whooping cough and influenza are believed by clinical observers to contribute to the tuberculosis mortality.

Measles is not a disease which warrants the light regard in which it is held by the people. It is looked upon as inevitable and exposure is often courted. To a considerable degree it is inevitable for it is most contagious and few go through life without having it. But the least that can be said regarding courting or avoiding it is that to some it is extrahazardous. For instance,

as noted above, the average age at death of measles is 4 years, and half the deaths occur under the age of 2 years. This indicates that it is a dangerous disease to young children. It is a disease attended with catarrhal inflammation of the air passages, and therefore it is hazardous to those predisposed to grave diseases of lungs or who are in feeble health. Therefore these should be safeguarded against it and those having custody of children should be educated to protect with special care the young and feeble from exposure to measles.

Much of the correspondence as to measles has been upon the subject of quarantining those having it. Some boards of health have paid it little attention. They have been advised to isolate the sick, allowing liberty to the well members of the family with the precaution that they remain in the open air for a little time before mingling with the public; to placard houses with a notice and warning outsiders to avoid entering it; to have school teachers instructed to inspect their pupils every morning and exclude all having acute coryza, since measles is infectious in the pre-eruptive stage; to instruct the people that measles is not a disease which warrants neglect, and advising them as to whom it is especially hazardous. If too strenuous measures are taken cases will be kept from report especially by those not having medical attendance, but a board of health is doing less than its duty if it does not take at least the care of an outbreak here outlined.

TYPHOID FEVER

No large epidemic of this disease occurred during the year. There were 7,894 cases of typhoid fever reported, and of these 3,613 came from New York city. The city with more than half the population of the State has less than half the cases of typhoid fever; it had more than three-fourths of the reported tuberculosis and diphtheria, more than one-half of the scarlet fever and measles.

The mortality of the State for typhoid fever was 1,309, or one death to six reported cases. In New York city there were 564 deaths, or one death to 6.4 reported cases, which probably indicates somewhat fuller reports of cases rather than a smaller lethality.

In 1908 there were reported 6,871 cases of typhoid fever with 1,368 deaths, a rate of one death in five reported cases, which would go to show that the type of the disease this year is milder. Indeed, this has been true, for in some of the localities in which there was a very considerable number of cases the mortality was very small in comparison.

In New York city there were 12.7 deaths for typhoid fever per 100,000 population; in the rest of the cities of the State there were 21.1 deaths for 100,000 population; and in the non-urban part of the State there were 14.6 deaths per 100,000 population, the rate for the entire State being 15. The high rates are in the cities outside the metropolis.

The following cities had a typhoid fever death rate exceeding 20 per 100,000 population for the year: Buffalo, 25.0; Troy, 22.0; Elmira, 34.0; Niagara Falls, 75.0; Watertown, 40.0; Newburgh, 47.0; Kingston, 31.0; Poughkeepsie, 23.0; New Rochelle, 24.0; Cohoes, 83.0; Oswego, 27.0; Lockport, 50.0; Corning, 124.0; Ogdensburgh, 27.0; Hornell, 21.0; Rensselaer, 30.0; Cortland, 24.0; Plattsburg, 26.0; Tonawanda, 27.0; North Tonawanda, 55.0; Oneonta, 80.0. The combined rate for the twenty-one cities is 33.0. The average of their rates is 40, and average of their rates for ten years prior is 46. If these are taken from the totals, the rate for the State would be 13.0; and for the State outside New York city, 14.0. Of the cities having an excessive typhoid fever mortality of 40 or over per 100,000 population, Niagara Falls in the last two years (prior to which time it had a rate of from 115 to 185) has fallen in 1908 to 87, and in 1909 to 75; part of its river water supply is now being filtered. Watertown prior to 1905 had for six years an average rate of nearly 100, and since then with mechanical filters in use the rate has been from 25 to 50. Newburgh for the past ten years has had an average rate of 40; this year there has been an excessive prevalence; its water supply is from small streams. Cohoes has the same mortality rate as its average for the past ten years; it uses unfiltered Mohawk river water, but is to install a filtration plant. Lockport also has the same rate as its ten-year average, but is having a new water supply from the Niagara river at North Tonawanda. The rate of North Tonawanda, with a Niagara river

water supply, has been increasing for three years, prior to which it was from 20 to 40. Oneonta, using partly surface streams and partly filtered water and doubtless local wells, has had a high typhoid mortality rate for two years and a ten-year average of 38. Corning has had an increasing typhoid rate for five years and an average of 47 for ten years; measures are in progress for improving its water supply. In these eight cities, with a combined population of 165,000, there were 109 deaths, and a rate of 66.

In fourteen cities with 463,000 population there were but thirty-seven deaths from typhoid fever, or eight deaths per 100,000 population. Rochester was one of this number, with a rate of 8.5 and an average rate for ten years of 15. It has a good water supply from Hemlock lake. The source of water supply of the other ten is various and their past records have also been various but seldom as good as this year. Yonkers has the distinction of having the lowest typhoid fever death rate of any city in the State, its rate being this year 7.0 and for the ten years before this 10.0. Oneida and Fulton had no deaths from typhoid fever this year.

On page 224 of the report of the Director of the Division of Vital Statistics will be found a table showing the relation of typhoid fever to water pollution, the mortality from typhoid fever per 100,000 population being shown in the cities of this State, and source from which the municipal water supply is derived.

Outside the cities there was excessive prevalence of typhoid fever at Cape Vincent, Clayton, Walden, East Kingston, Coopers-town and at Wingdale, Dutchess county. There was an abrupt outbreak at Cape Vincent about the 1st of April which was scattered about the village, sixteen cases in all, and three deaths. The common cause of winter or early spring epidemics, a river water supply, caused this as it did similar outbreaks here; its characteristics and history point to this. The water supply is from the St. Lawrence river, which so far as laboratory tests go is of remarkable purity and freedom from organic matter, but is exposed to typhoid bacilli abundantly discharged from up stream and not too remotely to reach Cape Vincent in viable condition. At Clayton below Cape Vincent there was a more extensive outbreak of typhoid fever of mild type later in the year,

during the summer. It likewise takes its water supply from the St. Lawrence, which receives typhoid excreta from points where the disease prevails, from its mouth to Ogdensburg, and notwithstanding its laboratory purity is unfit to drink raw. The typhoid bacillus might exist in this water supply, though not found in the laboratory examination of a small amount. It can well be stated that no water is safe for drinking purposes into which raw sewage is emptied, unless the same be subjected to the latest and best known process of filtration. At Walden, in the fall, typhoid fever has been prevalent for the past three years at least. In a population of 4,000 there were 38 cases in 1907, in 1908 there were 29 with 4 deaths, and 29 in 1909 with 3 deaths. Its water is from several driven wells, some of which show existence of intestinal impurity. At East Kingston there were about fifty cases, in a settlement of laborers living in a most insanitary way and spreading the disease, much of it by contact. At Wingdale there were cases among the laborers in a marble quarry, some of whom found their way to New York city hospitals.

In the annual Report of the Department for 1908 it was stated that the death rate from typhoid fever was the lowest ever recorded in the State, 16.0 per 100,000 population. For the ten years preceding the average rate had been 21.6. This year, 1909, it is still lower, 15.0 per 100,000 population. Not only the relative but the actual number of deaths from typhoid fever this year has been smaller than in any of the twenty-five years of record of this Department, except the first two, which were incomplete. With an average yearly of 1,534, this year there were 1,309. There have been years of certain long epidemics in which the total for the State has nearly reached 2,000, but generally with considerable uniformity there have been about 1,600 deaths yearly from typhoid fever. The city mortality from typhoid fever as a whole is higher than the rural. This is partly due to the fact that not a few cases credited to city mortality are of rural origin, contracted in the country by transient residence there, or drawn from the country to city hospitals. But urban mortality as a whole is made larger by reason of an excessive mortality of a few cities as has been shown. The city, with its controllable water supply, should be freer from typhoid fever than the country with

its more complex etiological factors. It is to be noted that at least in recent time the improvement for the State is, not wholly, but in good degree urban, especially this year.

Typhoid Fever Mortality, Urban and Rural

YEAR	URBAN		RURAL	
	Total deaths	Per 100,000 population	Total deaths	Per 100,000 population
1907.....	1,231	20.8	437	18.7
1908.....	1,006	16.3	362	15.0
1909.....	967	15.2	342	14.6

The urban mortality will ultimately be reduced below the rural as certain cities, which with their high mortality swell this total, establish more sanitary water supplies, as they are doing under the instigation and assistance of the Division of Sanitary Engineering of this Department. Among the numerous ways by which typhoid fever is contracted, the constant one, although the attempt is frequently made to look beyond it, of an infected water supply, stands out conspicuously. Numerous interesting and painstaking investigations have been made during the year, practically all of which confirm this as the chief condition of the existence of this disease. In the long run typhoid fever prevalence is a measure of the purity of a water supply. Every instance of typhoid fever is an evidence of a bad sanitary condition which admits of a remedy, and it is the aim of the Department to have every case accounted for. There is no typhoid fever without the typhoid bacillus, which came from a pre-existing case, often in a devious way and sometimes remote from its source or having lived long in some favoring medium, but generally reaching its susceptible subject along ways so well defined that the eradication of it from any community where it has secured an established habitat is a matter only of patient pursuit.

TYPHUS FEVER

It is now a considerable number of years since typhus fever has occurred in this State, and there was none in 1909; but in April, 1910, at the time of preparation of this report, one case

of this disease developed in a young immigrant a few days after leaving quarantine, in the town of Saugerties, proving fatal after a short illness.

CEREBRO-SPINAL MENINGITIS

Four hundred and sixty-six cases were reported during the year, of which 342 were from New York city. As cerebro-spinal meningitis is credited with 485 deaths the report of cases is incomplete. Three hundred and twenty-three of the deaths were from New York city, 72 from other cities, and 90 deaths were rural. Undoubtedly it is not seldom confused with other diseases, not only during life but on the death certificate, especially when sporadic cases appear to occur. Its largest prevalence was in the spring months, and the fewest were in the winter. There was no epidemic prevalence during the year in the State outside of New York city, where two-thirds of the deaths occurred.

EPIDEMIC POLIOMYELITIS

There was a not inconsiderable epidemic of this disease in the early fall, ending in October, in St. Lawrence county, in towns about Gouverneur. As this occurs epidemically and there is increasing evidence of its being an acute infectious disease, with some degree of communicability from the sick or from their environment, having also a period of incubation partly established, it may be noted in this chapter.* It is apparently a germ-produced disease, but diligent search for its specific micro-organism has not been yet rewarded. In numerous instances it has apparently resulted from contagion, but it has not been carried away to new points of prevalence by the sick and has been taken only by coming not only into the presence of the sick but into the infected area. Its period of incubation, that is of development of the disease after either having come into the epidemic

* At the Rockefeller Institute Flexner has recently demonstrated, in a communication of extraordinary interest, that poliomyelitis can be produced experimentally in the monkey by inoculating it with spinal cord from a subject, the disease developing in this animal after a period of incubation of from four to thirty-three days and pursuing a course analogous to that in the human subject; and it has been transferred from animal to animal without break. He has demonstrated that a recovered animal has become immune to the disease. The organisms constituting the virus are so small that they cannot be seen under the microscope, and that they pass through filters that bar the passage of all bacteria; he therefore calls it a filterable virus, which exists in other infectious diseases, such as yellow fever. We know nothing of this virus apart from or outside of its host; there is no evidence that filterable viruses have a saprophytic existence. He suggests that, as with epidemic cerebro-spinal meningitis, the naso-pharynx is the part of the body most concerned in disseminating the virus of epidemic poliomyelitis.

area or having been directly exposed to the disease by contact, has been within ten days. It appears not to be a disease which maintains a prolonged infectiousness of a locality nor to be readily transferable to other localities. As with its related disease, cerebro-spinal meningitis, it occurs sporadically as well as epidemically, for single cases occur with no disposition to the development of others in the locality.

It is a disease of childhood from earliest infancy to adolescence, with the common characteristics of a rather abrupt onset of fever attended with or soon followed by paralysis, which may either come on at once or be deferred for several days, but usually soon after onset. Observers find it in different forms and types. It is a febrile disease with an acute inflammation of the central nervous system, which varies in locating itself, on the cerebrum or more generally on the anterior horns or columns of the spinal cord, and the attending symptoms vary accordingly, with either coma or paralysis predominant. The after results of so-called infantile paralysis are most to be dreaded, for with only a limited number does it end fatally.

It is not a disease of bad sanitation, nor one affecting the environment of filth or poverty. In the extensive epidemic of 1908, which prevailed in and about New York city, it was not found especially in the filthy or crowded parts of the city nor traceable to uncleanly streets nor infected water. Although limited to an area the local conditions affecting the epidemic are as yet a matter of speculation. The weather conditions, topography, soil, water, land, have not been peculiar in areas where the disease has prevailed.

The St. Lawrence county epidemic was limited to a few adjacent towns, began in the early fall and ended, as is customary, in October. There were thirty or forty cases during its period of prevalence.

SMALLPOX

The number of deaths from smallpox was 4; the number of reported cases 852, or the same as in 1908; New York city reported 9 cases and 2 deaths.

The following is the distribution of smallpox, as reported and recorded, for the year:

Smallpox in New York State — 1909

COUNTY	Place	January	February	March	April	May	June	July	August	September	October	November	December
Albany	Albany						1						
	Berne				1								
	Cohoes				1								
Cattaraugus	Farmersville												1
	Hinsdale						2						
	Humphrey							1					
Cayuga	Genoa												1
Columbia	Ancram	1											
	Copake												
Cortland	Cortland				3	16	1	3				1	
	Homer		1		4	9							
Dutchess	Fishkill			1									
	Poughkeepsie			1									
Erie	Buffalo	1	2	1							8	1	2
	Collins												1
	Elma												3
	Evans												1
	Tonawanda										1	20	10
Franklin	Tupper Lake											1	
Fulton	Gloversville	2	1				1						
	Mayfield	1											
	Perth	1	1		1	3							
Genesee	Batavia			1									
Greene	Catskill	1				1				1			
Herkimer	Herkimer, town			2									
	Herkimer, village			2									
	Ilion	1											
	Little Falls				1								
	Newport							1					
	Old Forge						1						
	Wilmar						2						
Jefferson	Alexandria Bay												1
	Ellisburg								3				
Lewis	Lowville								1		2		1
	Lyonsdale								1				
	Turin								1				
	Watson										1		
Madison	Canastota				1								
	Sullivan		13	3									
Montgomery	Amsterdam, city	7	14		3	2							
	Amsterdam, town	3	1										
	Fonda	1	1		2								
	Hagaman		2	1									
	Mohawk			4	2	1							
	Palatine	2											
New York	New York city		1	5			2					1	
	Lockport												1
Niagara	Niagara Falls		1		1								1
	North Tonawanda										1	4	20
Oneida	Boonville					2	2						
	Forestport						2	1					
	Kirkland					1							
	New Hartford	5	13						1				
	Paris								4				
	Rome	1											
	Utica					8							
	Whitesboro					2	1	13		1			
	Whitestown					6	3	1					
Onondaga	Baldwinsville		2	1									
	Cicero		2	3									
	De Witt		2										
	Liverpool		1										
	Manlius			1									
	Syracuse	3	3				2						
Orange	Middletown											1	
Oswego	Albion	8	6										
Rockland	Ramapo								2				
St. Lawrence	Clifton											1	
	Colton	1											
	Parishville						5						
	Russell	7											
Saratoga	Charlton		5										
	Galway		1										

Smallpox in New York State — 1909 — (Concluded)

COUNTY	Place	January	February	March	April	May	June	July	August	September	October	November	December
Schenectady	Glenville	1	2	2									
	Schenectady		1										
Schoharie	Blenheim				1	6							
	Broome	2	15	12									
	Fulton	2	2	3									
	Gilboa	2	2										
	Middleburg	19			9	2							
	Schoharie	2											
Ulster	Gardiner			1									
	Marbletown	1											
Westchester	Saugerties			1	2	2							
	White Plains		1										

At the beginning of the year smallpox was epidemic in Amsterdam and had spread to surrounding towns; there had been 43 cases up to the end of 1908 and 30 cases followed in the early months of 1909 in the city. In Schoharie county there was an extensive epidemic which started in Middleburgh in December, 1908, and in the epidemic which lasted into May there were nearly 100 cases in the rural towns. In February smallpox was discovered at Bridgeport on Oneida Lake in the town of Sullivan, Madison county, and spread to numerous places about, to Baldwinsville, Cicero, Dewitt, Manlius, Albion and Syracuse, 50 cases in all. In April there was an outbreak in Cortland and Homer, with 36 cases up to July. In Oneida county smallpox began in December, 1908, in New Hartford, and the outbreak continued through February and was then abruptly stopped by the vaccination of virtually all of the people. In May Utica and the adjacent town of Whitesboro had an epidemic lasting several weeks, with 37 cases in all. Boonville and Forestport participated in an outbreak which by energetic management proved to be a small one which was discovered in June among guides employed about the Adirondack League Club in the Adirondacks, every person being followed up and vaccinated although the exposure was pretty well distributed.

In Jefferson and Lewis counties there were a number of cases in August, at Lowville and several towns about. This locality has a moving population and smallpox is easily scattered. Tonawanda in Erie county started in October an extensive epidemic,

said to have been introduced by a subject of smallpox from Canada, and up to the end of December had 30 cases, Buffalo and several towns of Erie county received the infection, and it almost simultaneously reached North Tonawanda in Niagara county, where 35 cases occurred and its epidemic was in full tide at the end of the year, Lockport and Niagara Falls being likewise affected. This locality is a stronghold of the opponents to vaccination and it was because of this that the epidemic was extensive and prolonged and indeed lasted far into 1910. The warrant for this is found in the fact, verified by experience this year, that when a locality is promptly and generally vaccinated there is no further spread of smallpox; those who have had smallpox have been unvaccinated. No casualties of any sort from vaccination have come to the knowledge of the Department during the year.

There appears to be a growing conviction that attempts other than vaccination to control smallpox are practically futile. The type of the disease has continued mild; a few persons have had it severely and to a disfiguring degree, but while there have by a moderate estimate been 1,000 cases, for certainly some have failed of detection, there have been not more than 5 deaths. Because it is mild it is easily scattered; people perhaps unconscious of the nature of their ailment go from place to place and no locality is safe from having it brought in; no one is sure not to meet with it in public conveyances. It is impossible to prevent this. Therefore there is no safety for anyone except by vaccination. Acting on this the health officials of two or three States have given up trying to protect the people from the negative side, that is by apprehending the sick and quarantining them; they have placed on the people the burden of self-protection and required them to guard themselves by having themselves vaccinated. We all very well know that if the school children are vaccinated a person having smallpox can attend the school without the least risk to them; that such a person can walk the streets and mingle with the people and no one will contract the disease. Unmindful of this and the easily available safeguard at the hand of everyone, a loud demand is made to shut up a person with this

most dreaded of all diseases who comes into the community, if necessary with an armed guard, all the cost of quarantine and the loss of business to the place because of its having this infection is undergone; whereas if everyone were immunized this infection carrier might be entirely ignored. Such a course has not been adopted in this State, but it is time that to have smallpox be regarded as a crime and that smallpox hospitals be regarded as an anachronism in a civilized community.

Bills were introduced into the Legislature during its recent session, as heretofore, one to repeal the law requiring the vaccination of all attending the public schools, another to modify it so as to virtually repeal it, and they were earnestly and doubtless conscientiously pressed by a large attendance at the hearings, while as a matter of course they were opposed by this Department as well as by the organized bodies of the medical profession. It is safe to say that until the Public Health Committees of the Legislature are made up of far less intelligent and philanthropic men than now compose them, all attempts to secure a favorable report on proposed legislation so misguided and detrimental to the public health will be unavailing.

VARICELLA

There has been no noteworthy prevalence of chickenpox this year, although occasionally it has been found with a confusing diagnosis against smallpox, especially in the case of adults. There has not come to the knowledge of the Department an instance of varicella in a person beyond the third decade. Of some the diagnosis has been difficult. Of unusual interest has been one case investigated and reported, where the amount of the eruption was extraordinary. The entire cutaneous surface almost was covered with parti-sized vesicles, some of them to a degree of semi-confluence, while the face was so thickly covered as to practically leave no uninvolved tissue and these lesions which were almost uniformly of one size, about twice that of a large split pea, were tensely filled and distended with lactescent or semi-purulent fluid; this on the fifth day of the eruption. The subject was a robust girl of 18. She had a history of appreciable illness for

five days prior to eruption, and it has been observed by us before that at this age a severe case of chickenpox has given a history of thus prolonged malaise prior to appearance of the exanthem.

OPHTHALMIA NEONATORUM

During the past year much valuable work has been done for the suppression of ophthalmia neonatorum. The state-wide campaign, which was so wisely and thoroughly planned by the late Dr. Wheeler, has been energetically pushed, and most satisfactory results obtained.

It has been highly gratifying to find such a ready response to the appeal issued to the physicians of the State, and to note the keen interest taken by the profession, in a determined effort to prevent this needless affliction to the new-born.

In prosecuting this work, an extensive correspondence has been carried on with over six thousand physicians in the State, outside of New York and Kings counties. As can well be appreciated this has been of decided advantage to the Department. It has enabled us to materially extend our acquaintance where most needed, among the medical profession, and to familiarize ourselves with those who are doing the accouchment work of the State. It has enabled us to tabulate, as will be seen below, those who do obstetrical work, and those who do not; to list those who agree to use some approved prophylaxis against ophthalmia neonatorum in all cases of child birth, as well as those who prefer not to commit themselves.

It has given us a practical working directory of physicians, to whom supplies can be sent with every assurance of their being used as suggested, thereby avoiding waste of time and material.

It has afforded an ideal means of arousing a mutual interest between the physician and the Department, not only in this particular effort, but sanitation in general. In short, it has been productive of much good, and will make its influence felt for years to come.

In addition to this correspondence work among the physicians, the midwives have been carefully looked after. So far as could be ascertained there are 243 midwives practising within the State. Many of them are ignorant women, utterly unconscious of the

dangers to which they are subjecting, both the child and the mother, under their incompetent care.

The names and addresses of these women were obtained and letters sent to each of them, asking for their co-operation for the suppression of ophthalmia neonatorum. In most instances they were found to be foreigners, who practised only among the people of their own nationality. To reach them intelligently, and inform them as to the best means to employ, the Department printed and circulated circulars of instructions in such languages as were found necessary to meet the requirements.

This, we believe, will result in much good. It will certainly put these women on their guard and force them to exercise at least some care in the toilet of the eyes of the new-born.

Fifty-one of the midwives addressed signed the pledge card, and are apparently anxious to comply with the instructions of the Department. We propose to so push this work among the physicians and midwives, that at no distant date, we will have a complete card index of every person doing accouchment practice within the State.

We also propose to study in detail the existence of every case of this disease reported to the Department, and to render every possible assistance to prevent a second case in the same community.

As will be seen, the following table shows the number of physicians in each county, who have signed the pledge card to employ some approved prophylaxis in all cases of child birth, those who are doing no obstetrical work, those who did not sign and the total number communicated with:

Table of Correspondence with Physicians on Ophthalmia Neonatorum

COUNTY	Number who have signed	Number who do no obstetrical work	Number who have not signed	Total	Remarks
Albany.....	153	30	54	237	
Allegany.....	53	.....	12	65	
Broome.....	84	38	39	161	
Cattaraugus.....	65	9	16	90	
Cayuga.....	62	15	31	108	
Chautauqua.....	93	6	41	140	
Chemung.....	73	11	10	94	
Chenango.....	44	2	16	62	
Clinton.....	35	9	9	53	
Columbia.....	45	4	15	64	
Cortland.....	37	2	10	49	
Delaware.....	41	.....	28	67	
Dutchess.....	90	18	27	135	
Erie.....	474	189	194	857	
Essex.....	26	.....	24	50	
Franklin.....	41	1	16	58	
Fulton.....	38	6	16	60	
Genesee.....	41	1	10	52	
Greene.....	31	.....	11	42	
Hamilton.....	1	.....	4	5	
Herkimer.....	52	2	25	79	
Jefferson.....	81	13	46	140	
Lewis.....	18	.....	12	30	
Livingston.....	42	.....	29	71	
Madison.....	50	6	15	71	
Monroe.....	276	54	111	441	
Montgomery.....	42	3	13	58	
Nassau.....	59	.....	33	92	
Niagara.....	87	8	33	128	
Oneida.....	144	48	58	250	
Onondaga.....	228	96	55	379	
Ontario.....	69	3	12	84	
Orange.....	100	30	35	165	
Orleans.....	36	3	10	49	
Oswego.....	78	13	13	104	
Otsego.....	56	8	23	87	One refusal.
Putnam.....	6	.....	9	15	
Queens.....	85	.....	95	180	
Rensselaer.....	110	24	44	178	
Richmond.....	27	1	34	62	
Rockland.....	31	1	15	47	
St. Lawrence.....	75	20	36	131	
Saratoga.....	53	2	25	80	
Schenectady.....	55	22	31	108	
Schoharie.....	34	.....	9	43	
Schuyler.....	16	2	12	30	
Seneca.....	36	4	8	48	
Steuben.....	84	13	43	140	
Suffolk.....	70	22	35	127	
Sullivan.....	32	2	13	47	
Tioga.....	33	3	15	51	
Tompkins.....	47	13	18	78	
Ulster.....	60	9	27	96	
Warren.....	36	9	15	60	
Washington.....	40	3	19	62	
Wayne.....	51	.....	18	69	
Westchester.....	215	69	83	367	
Wyoming.....	40	2	10	52	
Yates.....	25	3	1	29	
Total.....	4,206	868	1,719	6,777	

As will be seen from the above, practically two-thirds of all the physicians of the State, outside of New York and Kings counties, have joined with the Department of Health, in a common crusade against ophthalmia neonatorum. Even more than this, as many

of those who did not sign have expressed themselves in approving terms of the idea, though unwilling to commit themselves to any treatment other than that which they had used in their own practice, with success, for many years.

Something of an idea might be gained of the interest being taken in this new line of work, in the fact that 20,000 cases of supplies for its prevention, were mailed to health officers and the physicians during the past year. Since January 1, 1910, requisitions for these supplies have sometimes come in so rapidly as to overtax the mailing capacity of the State Hygienic Laboratory. Its object is so lofty, so charitable, so vital to so many human lives, as should well arouse the united efforts of not only one profession, but of mankind in general, to accomplish its purpose. No relaxation should be permitted in this humane movement, for the salvation of the eyes of our helpless children, so long as a single case exists within our proud State.

INFLUENZA

This is an infectious disease which has not failed to recur epidemically each winter since the pandemic of 1889, and to this recurrence 1909 has not been an exception.*

There is no record of the number of cases that occurred; doubtless in some degree it reached a large proportion of the people. It is credited with having been the cause of 1,117 deaths, but even of its real mortality there is no certain record. Comparatively few die so directly from uncomplicated influenza as to have this certified as the immediate cause of death. But it contributes largely to mortality attributed to other causes but which was primarily due to this disease and which would not have occurred except for infection with its bacillus. This is recognized by practicing physicians in the clinical symptom-complex of this extraordinary disease.

It is remarkable that in the year 1890 there was an abrupt rise in the number of deaths recorded as from acute respiratory diseases. Prior to that year the annual mortality from this cause had been less than 14,000; it rose in 1890 at once to 18,000,

* "The winter of 1889-90 is indelibly engraved on the history of great epidemics; an influenza epidemic greater than any before arose in the far east, spread like a hurricane through Europe, and thence over the greater part of the earth. Before that it was only known historically." — LICHTENSTEIN, in the Nothnagel Series.

and has since been seldom below it. This was coincident with the appearance of the first grippe epidemic.

There was also an increase of 1,500 in the mortality from consumption, an increase in that from diseases of the nervous system, a moderate increase in the digestive and circulatory diseases, and also in the deaths from old age and other enfeebling conditions. Since 1890 these increases, chiefly in deaths from pneumonia and other acute diseases of the respiratory system, on which it primarily expends itself, have coexisted with the influenza epidemics, have swelled with the tide of the epidemic and have varied with the severity of the epidemic, that from respiratory diseases ranging from 16,000 to over 20,000 deaths annually. The inference is that this increase has been mainly due to epidemic influenza.

Assuming this, estimates have been made of the probable mortality from this cause from the first as the course of the epidemics have been noted year by year. The following table is brought down from one taken from the Annual Report of the Department of five years ago. It is certainly impossible to state with any accuracy how much of the mortality can be legitimately attributed to influenza in the twenty years since its annually recurring epidemics began, but there are grounds for believing that these estimates are approximate and that pretty nearly 150,000 deaths in that time have been due to it.

Estimated Mortality from Epidemic Influenza

EPIDEMIC YEAR	Height of epidemic	Duration	Mortality	Acute respiratory mortality of year
1890.....	January.....	3 months	5,000	18,053
1891.....	April.....	6 months	8,000	20,697
1892.....	January.....	5 months	8,000	20,432
1893.....	April.....	6 months	6,000	19,807
1894.....	January.....	4 months	3,000	15,885
1895.....	February.....	4 months	5,000	17,725
1896.....	March.....	5 months	2,750	16,820
1897.....	March.....	4 months	3,000	16,277
1898.....	March.....	6 months	2,500	16,350
1899.....	January.....	5 months	7,000	17,938
1900.....	March.....	6 months	11,500	19,232
1901.....	January.....	5 months	7,000	17,589
1902.....	February.....	6 months	5,000	16,986
1903.....	March.....	6 months	8,000	17,339
1904.....	March.....	6 months	10,000	21,132
1905.....	February.....	5 months	9,000	17,832
1906.....	March.....	6 months	9,000	20,178
1907.....	January.....	6 months	10,000	22,663
1908.....	January.....	5 months	9,500	18,477
1909.....	March.....	5 months	9,000	20,781

The seasons affected by grippe are the winter and spring. The epidemics usually begin in December and the highest point is reached often in January or as often in March. It is in the inclement season that the influenza germ comes into activity.

As a reported cause of death the actual rural mortality is greater than the urban, although the population is one-third that of the urban. There have been in the last three years 13 deaths per 100,000 population reported from influenza in cities and 38 per 100,000 population in rural towns. But at the same time the acute respiratory mortality in the cities has been 260 and in the country 160. The United States Census reports the influenza mortality in cities as 19.8 per 100,000 population in 1907, and in rural districts, 32.2; in 1908 it is given as 14.7 and 29.8, respectively. Reports of all States covering a period of five years show uniformly a much larger reported mortality in rural districts than in cities from influenza. These records also show that the average age at death from influenza is 57 years, and the median age, or middle points at which the number of decedents younger is the same as the number older, is 66.5. It further shows that the average age of males at death is less than of females. If deaths secondary to influenza were included the age mortality would be found much lower than this.

PELLAGRA

There was one death reported from this disease in the November *Bulletin*, from Brooklyn, but the cause of the death was subsequently amended as due to chronic poisoning of another sort. While this disease has not as yet taken a part in the mortality and to slight degree only in the morbidity of the State, there is room for its appearance, having developed within recent time, in some of the Southern States and in the form of a considerable outbreak in a hospital for the insane in Illinois. It has long existed in countries of southern Europe, in Italy especially. There is as yet a lack of definite knowledge regarding its cause and it is a disease of uncertain nature, but there is an apparent growing conviction that it belongs in the class of infectious diseases, and among those concerned with this chapter of the report. It is

essentially a chronic disease, with remissions and aggravations characterized by languor and enfeeblement with intestinal disturbance, eventually with nervous disturbances both mental and physical, and with eruption upon the skin, the exposed parts mostly, which is reddened or inflamed and subsequently following repeated attacks of dermatitis becoming dark of color and rough. The study this disease is receiving will evolve more definite knowledge of its prophylaxis.

TUBERCULOSIS CAMPAIGN

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TUBERCULOSIS CAMPAIGN

EUGENE H. PORTER, M.D., *State Commissioner of Health,
Albany, N. Y.:*

DEAR SIR— I have the honor to submit herewith a report on the Traveling Tuberculosis Exhibition of the Department of Health for the year 1909.

During the year the Tuberculosis Exhibition of the New York State Department of Health was shown in thirteen cities in the following order: Binghamton, Oswego, Cohoes, Poughkeepsie, Yonkers, Middletown, Newburgh, Kingston, Syracuse, Corning, Olean, Jamestown and Dunkirk.

In each city the campaign of popular education in connection with the exhibit was prosecuted with vigor, and under the joint auspices of this Department and the State Charities Aid Association, gratifying results were achieved.

Large attendance at the exhibition and public meetings is of the utmost importance in bringing forcibly to the individual the facts that he should know to make it possible for him to do his part in the warfare against the disease. Experience has shown, however, as in the case of the city of Dunkirk, the inauguration of public and official effort for the suppression of tuberculosis may follow quickly in the wake of a campaign for popular education that has been most unsuccessful in point of reaching the people. The rapidity with which local official measures are adopted is usually gauged by the energy exerted by a few influential citizens who become interested.

The total attendance at the exhibition in the thirteen cities was 125,348. The largest attendance was at Syracuse, where the figures reached 24,405, or about 20 per cent. of the entire population. This splendid result was achieved despite the coincidence of an unusually active municipal political campaign with several mass meetings in progress in various parts of the city simultaneously with the tuberculosis meetings. How these results were secured is detailed in Plate I, a reprint from the *Syracuse Post-*

Standard. The results in Syracuse were particularly gratifying as experience has demonstrated the difficulty of enlisting the public attention in a work of this character on account of the multiple religious, social and amusement activities competing for attention.

The smallest attendance was at Dunkirk, where 3,402 persons called in person at the hall where the exhibit was held. Undoubtedly the inclement weather, stretching over the entire period of the campaign in that city, was the cause.

Gauging results by the percentage of the population of the various cities that was interested to the extent of going to the exhibition and meetings, Olean captured the honors. Sixty-eight per cent. of its population responded. Yonkers had the smallest percentage of its population (13.9) secure the benefits of the educational campaign. Binghamton, with 14.4 per cent., was the only other city showing less than 20 per cent. of total population in attendance. The average attendance in all the cities compared to the total population was 34.7 per cent.

NEWSPAPER CO-OPERATION

That the public press in the thirteen cities liberally supported this effort to educate the people in the prevention of tuberculosis is shown by the fact that the newspapers in the thirteen cities devoted 465 columns of matter to the subject. Most of the newspaper publicity consisted of regular reading matter, advance notices of the various features of the campaign, large display advertisements, either contributed by the papers or by the merchants of the respective cities. (Plate II.) Some space was devoted to the printing of the large educational banners and cartoons originated by the Department. (Plates III to V.) The newspapers of the city of Middletown devoted 63 columns and 14 inches to the campaign, thereby holding the record for the year. The smallest of space (14 columns and 14 inches) was given by the press of Kingston. The average amount of space for the thirteen cities was thirty-six columns.

LITERATURE DISTRIBUTION

The literature on tuberculosis for which the Department endeavored to secure as general distribution as possible consisted of

Plate II

1910-1911

MIDDLETOWN DAILY ARGUS, WEDNESDAY, APRIL 13

GO TO THE ARMORY

See the Tuberculosis Exhibition of the State
Department of Health.

"It is within the Power of Man to cause all germ diseases to disappear from the earth."

PASTEUR.

"It is in my judgment a conservative statement that at least one-half of the existing sickness and mortality from Tuberculosis could be prevented within the two next decades by the application of rational and entirely practical measures, and I believe we can look forward to a much larger success."

Prof. WM. H. WELCH, M. D., LL.D.

"To successfully combat Tuberculosis requires the combine action of a wise government, an intelligent people and well trained physicians."

KNAPP.

"An important aspect of the crusade against tuberculosis is that success in the struggle signifies also social betterment, enlightenment in ways of healthy living, awakening an intelligent interest and education in individual and public hygiene in general."

Prof. WM. H. WELCH, M. D., LL.D.

"The people have recognized their true foe in Tuberculosis and are striving to the combat throughout the civilized world."

Prof. WM. H. WELCH, M. D., LL.D.

Attend the Big Mass Meeting Next Monday Night.

We, the undersigned, hereby donate our advertising space, in the paper mentioned below, for advertising the Middletown Campaign for the Prevention of Tuberculosis:

Program of Meetings.

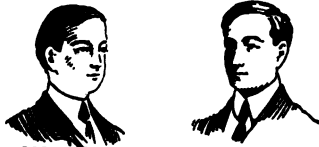
Wednesday, April 13th
8:00 P. M. - Meeting of the Board of Health and the Tuberculosis Association, at the Armory, Middletown, Conn.
9:00 P. M. - Address by Prof. W. H. Welch, M. D., LL.D., President of the American Association of Pathologists and Bacteriologists, on "The Prevention of Tuberculosis."
10:00 P. M. - Address by Dr. J. C. Knapp, Secretary of the American Association of Pathologists and Bacteriologists, on "The Prevention of Tuberculosis."
11:00 P. M. - Address by Dr. J. C. Knapp, Secretary of the American Association of Pathologists and Bacteriologists, on "The Prevention of Tuberculosis."

This Space is Used by Courtesy of the Argus and Following Advertisers

Advertisers:
J. C. Knapp, Secretary of the American Association of Pathologists and Bacteriologists.
J. C. Knapp, Secretary of the American Association of Pathologists and Bacteriologists.
J. C. Knapp, Secretary of the American Association of Pathologists and Bacteriologists.
J. C. Knapp, Secretary of the American Association of Pathologists and Bacteriologists.
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J. C. Knapp, Secretary of the American Association of Pathologists and Bacteriologists.
J. C. Knapp, Secretary of the American Association of Pathologists and Bacteriologists.



Plate III



**STARTING THE BATTLE OF
LIFE WITH PERFECT HEALTH**



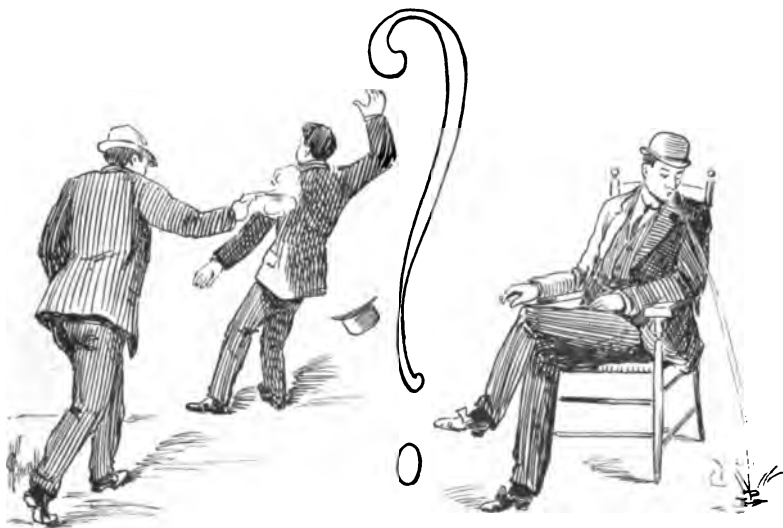
WHICH PATH ARE YOU ON?
NEW YORK STATE DEPARTMENT OF HEALTH.





Plate IV

WHAT IS THE DIFFERENCE BETWEEN THE TWO?



**THIS ONE USUALLY
KILLS HIS ENEMIES**

**THIS ONE OFTEN KILLS
HIS FRIENDS AND KIN.**

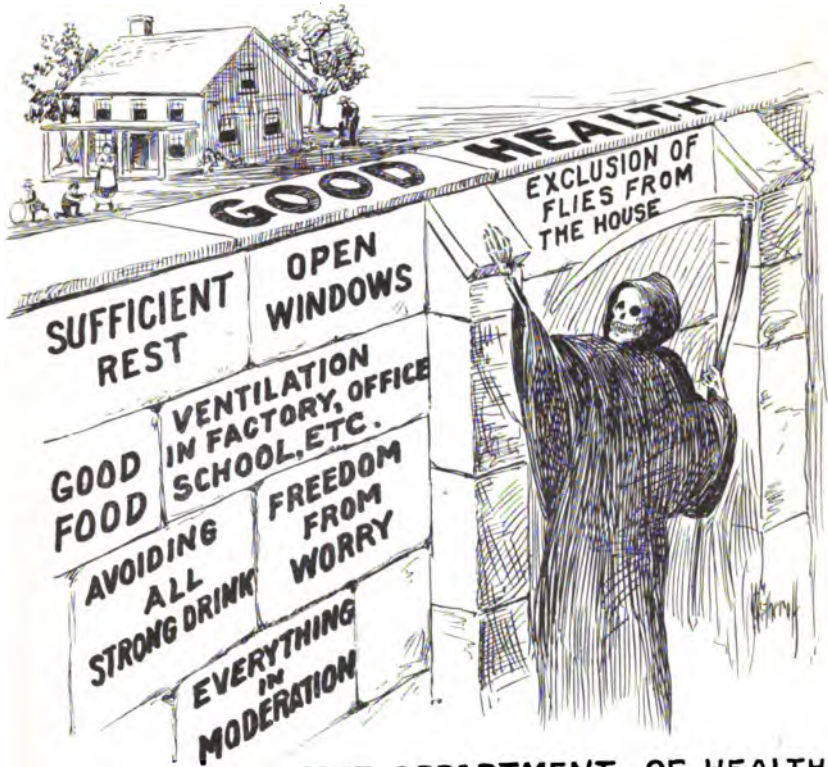
NEW YORK STATE DEPARTMENT OF HEALTH.



3

Plate V

HOW HIGH IS YOUR WALL?



NEW YORK STATE DEPARTMENT OF HEALTH.





Plate VI

Newburgh, N. Y., April 22, 1909.

Dear Doctor:

The Newburgh Bay Medical Society will hold a special scientific meeting, at the Palatine Hotel, Newburgh, Wednesday afternoon, April 28, at 3.30 o'clock. This meeting is incidental to the Newburgh Campaign for the Prevention of Tuberculosis.

Through Dr. Eugene H. Porter, State Commissioner of Health, the following has been arranged:

Dr. HERBERT MAXON KING,

Physician in Chief, Loomis Sanitarium, Loomis, N. Y.

"The Diagnosis of Incipient Tuberculosis."

Dr. LEWIS GREGORY COLE,

Radiographic Expert, New York City Department of Health.

"The X-Ray in Diagnosis of Early Pulmonary Tuberculosis"
with slide demonstrations.

At 5.30 o'clock a colation will be served in the private dining room of the Palatine, at which non-members attending the meeting will be guests of the Society. Please reply immediately on the enclosed postal, whether or not you will attend.

Dr. E. C. THOMPSON, Secretary.

Dr. E. ROSS ELLIOTT, President.



the "Don't Card," a fac simile of which is printed as plates XI-XIII, volume I, Annual Report of 1907. It was also sought to give the circular on "Consumption," issued by the Division of Communicable Diseases of the Department as general distribution as the "Don't" card. During the latter part of the year there was also included for general distribution reproductions of the large pictorial educational banners, on paper 18 x 24 inches, shown on page 312, volume I, Annual Report of this Department, for 1908. This banner sheet was also tacked up on walls in factories, offices, post-offices and other public places. A large percentage of the literature was placed in the hands of school children, who either attended the exhibition and meetings with their teachers or were lectured to in their school rooms.

The number of "Consumption" leaflets given out was 80,710; "Don't" cards, 90,220; banner sheets, 5,500. Total, 176,430.

MEDICAL MEETINGS

It has been the policy of the Department from the inception of its teaching tuberculosis exhibition to hold scientific medical meetings under the auspices of local medical societies in connection with the local educational campaign. For each such meeting the Department furnished a physician eminently qualified to deliver a paper on a subject related to tuberculosis. The paper most generally dealt with the diagnosis of incipient tuberculosis. The Department organized these meetings, detailed physicians from its staff of lecturers and in most cases printed in the program and invitation which was sent by the local medical society to physicians of all schools within a radius making it convenient for them to attend. Plate VI represents a typical invitation to a medical meeting.

Programs of the medical meetings follow:

Binghamton

Monday, January 12, 1909.

Under auspices of Broome County Medical Society, Dr. Emily H. Wells presiding. "The Diagnosis of Incipient Pulmonary Tuberculosis," Dr. Albert H. Garvin, superintendent of the State Hospital for Incipient Tuberculosis at Raybrook. "The Use of

the X-ray in the Diagnosis of Tuberculosis" (with stereopticon), Dr. Clarence E. Coon, Syracuse.

Oswego

Medical meeting held prior to campaign in year 1908.

Cohoes

Wednesday, February 3, 1909

Meeting of physicians of Cohoes, Waterford and vicinity. Dr. Chas. E. Whitbeck, presiding. "The Diagnosis of Incipient Tuberculosis," Dr. H. B. Doust, physician in charge of municipal tuberculosis clinic, Syracuse. "The Use of the X-ray in the Diagnosis of Pulmonary Tuberculosis," Dr. Arthur H. Holding of Albany.

Poughkeepsie

Monday, February 22, 1909

Under auspices of the Medical Society of the County of Dutchess. Dr. A. H. Garvin, superintendent of the New York State Hospital for Incipient Tuberculosis at Raybrook, will present the diagnosis of incipient tuberculosis cases. Dr. A. F. Holding of Albany will present "The Use of the X-ray in Tuberculosis Diagnosis." This paper will be illustrated with the lantern.

Yonkers

Tuesday, March 16, 1909

Under auspices of Medical Society of the County of Westchester. Informal talk to physicians by Dr. James Alexander Miller, New York.

Middletown

Tuesday, April 6, 1909

Under auspices of the Orange County Medical Society, Dr. D. B. Hardenbergh, Middletown, presiding. "The Early Diagnosis of Tuberculosis," Dr. Herbert Maxon King, physician-in-chief Loomis Sanatorium, Liberty, N. Y. "Use of the X-ray in Diagnosing Tuberculosis," Dr. Lewis Gregory Cole, radiographic expert, New York city department of health.

*Newburgh**Wednesday, April 28, 1909*

Under auspices of the Newburgh Bay Medical Society. "The Diagnosis of Incipient Tuberculosis," Dr. Herbert Maxon King. "The X-ray in Diagnosis of Early Pulmonary Tuberculosis," with slide demonstration, Dr. Lewis Gregory Cole.

*Kingston**Friday Evening, May 21, 1909*

Under auspices of Medical Society of the County of Ulster. "The Diagnosis of Incipient Pulmonary Tuberculosis," Dr. Albert H. Garvin, Raybrook, N. Y. "The Use of the X-ray in the Diagnosis of Pulmonary Tuberculosis," Dr. Arthur F. Holding, Albany.

*Olean**Thursday, November 18, 1909*

Under auspices of Medical Society of the County of Cattaraugus, Dr. W. W. Jones, president of society, presiding. "The Diagnosis of Incipient Pulmonary Tuberculosis," Dr. H. Burton Doust, chief of Syracuse Municipal Tuberculosis Clinic.

*Jamestown**Thursday, December 9, 1909*

Under auspices of Jamestown Medical Society. "The Duties of the Ordinary Practitioner, when Confronted with a Case of Incipient Tuberculosis," Dr. George William Beach, attending physician Mountain Sanatorium, Binghamton, N. Y. Dr. J. J. Mahoney, president of society, presiding.

*Dunkirk**Wednesday, December 8, 1909*

Under auspices of Dunkirk and Fredonia Medical Society. "The Duties of the Ordinary Practitioner when Confronted with a Case of Incipient Tuberculosis," Dr. George William Beach.

The total attendance at the medical meetings for the year was 356.

The thanks of this Department are hereby acknowledged to the physicians who delivered papers as above noted.

AT THE STATE FAIR

Independently of the Department's general exhibit, dealing with the work of the several divisions in detail, in the State building at the New York State Fair, September 13 to 18, 1909, the traveling tuberculosis exhibit of this Department was installed in another building and was viewed by thousands of those attending the fair.

RECONSTRUCTION OF EXHIBIT

The exhibition of this Department as shown at the International Congress on Tuberculosis at Washington, September 21 to October 12, 1908, continued in use for the municipal campaigns in this State without alteration until the summer of 1909. It comprised many charts of a technical nature incomprehensible to the layman. Other features were presented in an uninteresting manner and the text in many cases was in too fine type to be easily read. There was also a lack of classification of the various phases of the subject. Mechanical arrangements were employed that were cumbersome and made the cost of transportation greater than necessary. It was therefore deemed advisable to reconstruct the exhibit, and acting under your instructions to produce the best exhibit possible with the funds in hand, an entire rearrangement and popularization of the subject-matter was effected. All superfluous text was eliminated. The type employed was clear and distinct with a minimum height of one-quarter inch. Many of the charts were beautifully colored and the attractiveness of the exhibit considerably enhanced. The subject-matter was divided into twelve subdivisions, as follows:

- A. Statistics of Tuberculosis.
- B. Nature of Tuberculosis.
- C. How the Disease Spreads.
- D. How to Stop Its Spread.
- E. How to Cure the Disease.

HOW TO CURE TUBERCULOSIS.

Figure 1. Mean values of the dependent variables for the three groups. Error bars represent standard error of the mean.



100



HOW TO STOP ITS SPREAD.

Run away
from
distressing
the spread of
tuberculosis.

Sunlight and
fresh air kill
the germ in
the sputum.
Rooms that are
dark and damp
are dangerous.

Working and
sleeping
in rooms with
lots of fresh air
helps to stop the
spread of
Tuberculosis.

Keeping strong
and healthy makes
the body naturally
resist disease.

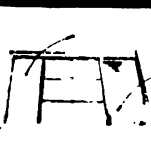
Push our
Pinks of Goddard
through real and
vigilant of
even a help
stop the spread
of the disease.

The careful
care and
the disease.

THE VISITING HORSE



WINDOW VENTILATION



THE FREE DISPENSARY



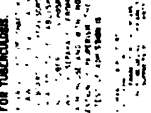
SLEEPING ALONE



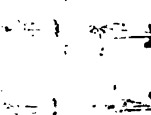
THE CAREFUL CODE



A COUNTY HOSPITAL FOR TUBERCULOSIS



THE MOST EFFECTIVE WAY



THE MOST EFFECTIVE WAY



THE MOST EFFECTIVE WAY



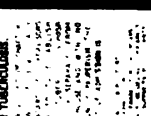
THE MOST EFFECTIVE WAY



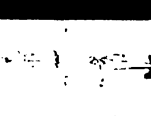
THE MOST EFFECTIVE WAY



THE MOST EFFECTIVE WAY



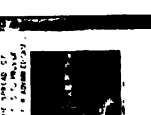
THE MOST EFFECTIVE WAY



THE MOST EFFECTIVE WAY



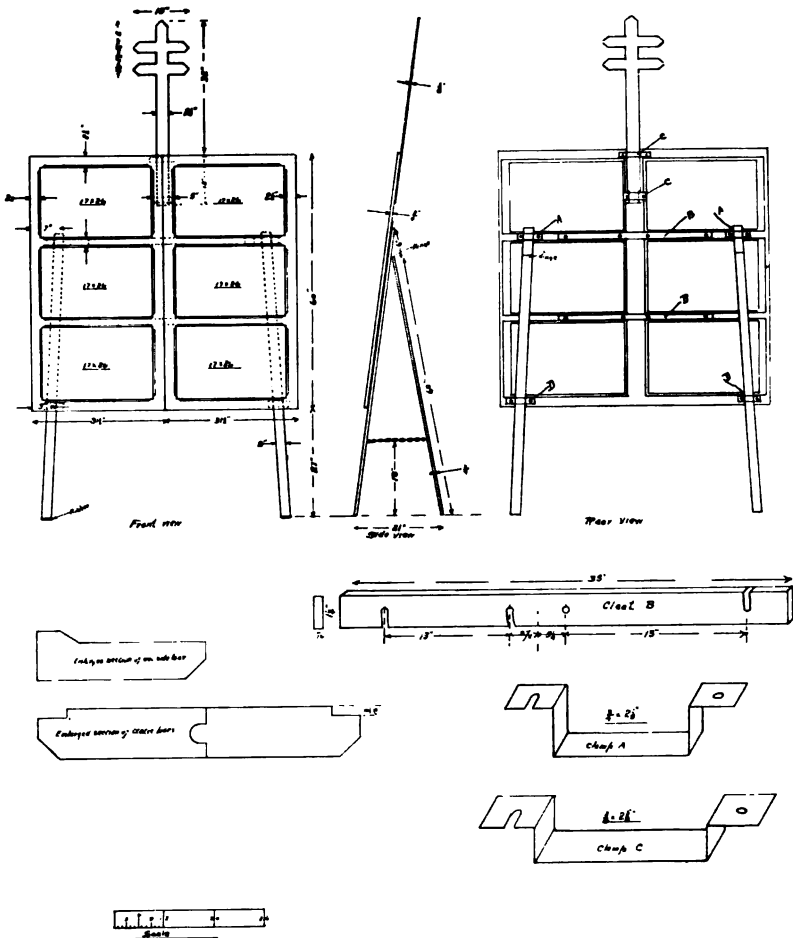
THE MOST EFFECTIVE WAY



THE MOST EFFECTIVE WAY



Plate IX



WORKING DRAWING OF MECHANICAL FEATURES OF SMALL EXHIBIT.



Plate X



SERIES A

ONE IN TEN TUBERCULOSIS CAUSES ONE DEATH IN EVERY TEN DEATHS STUDY THIS EXHIBIT. DON'T BE THE ONE

THE TUBERCULOSIS BACTERIUM IS A MICROSCOPIC
ORGANISM THAT IS NOT VISIBLE TO THE NAKED EYE.
AND IT IS THE CAUSE OF ALL DEATHS FROM TUBERCULOSIS.
IT IS THE MOST COMMON OF ALL DISEASES.
IT IS THE MOST COMMON OF ALL DISEASES.
IT IS THE MOST COMMON OF ALL DISEASES.
IT IS THE MOST COMMON OF ALL DISEASES.
IT IS THE MOST COMMON OF ALL DISEASES.
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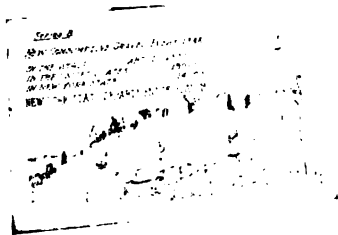
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IT IS THE MOST COMMON OF ALL DISEASES.
IT IS THE MOST COMMON OF ALL DISEASES.

DR. A. CHANCE

"The people have recognized their true foe in
tuberculosis and are stirring to the combat
throughout the civilized world"

Prof. Wm. H. Welch, M.D., F.R.C.S.



- F. Organizations Against Tuberculosis.
- G. The Community Against Tuberculosis.
- H. The State Against Tuberculosis.
 - I. The State Hospital at Raybrook.
- J. The Public Health Association Against Tuberculosis.
- K. Private Sanatoria Against Tuberculosis.
- L. Private Sanatoria Against Tuberculosis.

Each of the above sections comprised eighteen framed cards, twenty-two by twenty-eight inches, arranged in tiers of six horizontally. The upper tier of charts on frames being elevated several feet above the line of vision and necessarily removed from close scrutiny contained only brief aphorisms and terse facts in letters one and a quarter inches high. The two lower tiers being so situated so as to permit closer study contained the smaller text and illustrations, mostly water color drawings and photographs. (Plates VII-VIII.)

A special small tuberculosis exhibit for use in schools, railway stations, post-offices, factories, etc., submitted by the Department in the competition for a prize offered by the American Medical Association at Atlantic City, June 8 to 11, 1909, was awarded honorable mention. (Plates IX-X.) The special features claimed for this exhibit were as follows:

The tuberculosis exhibit submitted by the New York State Department of Health in the competition for a prize offered by the American Medical Association at its annual session in Atlantic City, June 8th to 11th, has been designed to meet the requirements of an inexpensive yet comprehensive presentation of the subject in a form that could be conveniently transported and easily installed under a variety of conditions in railway stations, post-offices, schools, halls, etc.

Realizing the value of repeated statement of facts as a powerful means of causing the mind to retain desired information, this exhibit has been planned to be regarded with fresh interest by a person, even though he has previously studied it. This end is achieved by a complete change of the text and pictorial contents of the exhibit at certain intervals.

For instance, the exhibit has been installed in a schoolhouse by the local health officer or person to whom it has been loaned by

the agency owning it. After the exhibit material marked "Series A" has been on display several days or a week, the health officer or other person in charge, removes this series and substitutes the several cards and banners comprising "Series B." After another interval of time "Series B" is removed and "Series C" substituted and in due time "Series D" is shown.

Each separate series presents all the salient facts about tuberculosis in a graphic and interesting manner and renewed interest is created in the exhibit.

If a person sees but one series displayed, the facts that should be remembered are before him, but should he subsequently see the same facts presented in a new manner with new pictures and text, his interest would be again aroused to a point compelling attention.

The text and pictorial contents of the several series submitted are more or less tentative and may be modified to suit local conditions. Text and pictorial matter may be improvised for the advocacy of local municipal measures for the prevention or cure of tuberculosis. The text and pictorial features submitted in the competition may be duplicated at a nominal cost.

The other claims made for the exhibit are:

It may be installed in any room eight feet or more in height.

It can be hung on the wall.

It may be stood upon the floor, in a corner, center of room or wherever desired, as it is self-supporting.

Any number of frames may be assembled either on a wall or self-supporting structure to form a more pretentious exhibit, the six-paneled frame being regarded as the unit, which may be extended indefinitely in either direction.

LECTURES ON TUBERCULOSIS

The work of securing local physicians to deliver popular lectures in connection with the exhibition was greatly facilitated by the publication by the Department of a booklet containing reproductions of the forty odd slides comprising a standard illustrated lecture on tuberculosis. The picture of each slide in the booklet was accompanied by suitable text describing the slides and aiding the physician greatly in preparing for his lecture.

During the year 152 physicians delivered this lecture in behalf of the Department. The lecture was also used by physicians and laymen in many localities where the exhibition was not shown, the slides being loaned by the Department.

The thanks of this Department are due and are hereby expressed to the following physicians who delivered lectures:

Dr. J. P. Wilson (delivered lecture).....	Arlington
Dr. W. A. Moore.....	Binghamton
Dr. Emily H. Wells.....	Binghamton
Dr. L. D. Farnham.....	Binghamton
Dr. Joseph Kane	Binghamton
Dr. George H. Jenkins.....	Binghamton
Dr. George W. Beach.....	Binghamton
Dr. H. C. Sears.....	Binghamton
Dr. George H. Lathrope.....	Binghamton
Dr. C. A. Squires.....	Binghamton
Dr. Francis Fronczak	Buffalo
Dr. Charles R. Borzilleri.....	Buffalo
Dr. J. L. Archambeault.....	Cohoes
Dr. John Archibold	Cohoes
Dr. E. M. Bell.....	Cohoes
Dr. J. C. E. Daunais.....	Cohoes
Dr. M. J. Keough.....	Cohoes
Dr. J. F. McGarrahan.....	Cohoes
Dr. J. H. Mitchell.....	Cohoes
Dr. G. U. Peltier.....	Cohoes
Dr. C. L. Witbeck.....	Cohoes
Dr. J. L. Miller.....	Corning
Dr. J. N. Shumway.....	Corning
Dr. H. B. Smith.....	Corning
Dr. T. A. McNamara.....	Corning
Dr. H. E. Batten.....	Corning
Dr. E. H. Hutton.....	Corning
Dr. E. J. Carpenter.....	Corning
Dr. J. F. Dwyer.....	Corning
Dr. F. S. Swain.....	Corning
Dr. A. H. Rodgers.....	Corning

Dr. M. S. Coxe.....	Dunkirk
Dr. J. A. Weidman.....	Dunkirk
Dr. V. D. Bozovsky.....	Dunkirk
Dr. W. J. Sullivan.....	Dunkirk
Dr. Joseph Rieger.....	Dunkirk
Dr. George E. Ellis.....	Dunkirk
Dr. George E. Blackham.....	Dunkirk
Dr. George B. Kalb.....	Erie, Pa.
Dr. A. W. Dodds.....	Fredonia
Dr. N. G. Richmond.....	Fredonia
Dr. William M. Bemus.....	Jamestown
Dr. A. J. Robbins.....	Jamestown
Dr. D. C. Perkins.....	Jamestown
Dr. R. M. Bradley.....	Jamestown
Dr. W. J. Pennock.....	Jamestown
Dr. M. N. Bemus.....	Jamestown
Dr. J. W. Nelson.....	Jamestown
Dr. Labon Hazeltine.....	Jamestown
Dr. Jane L. Greeley.....	Jamestown
Dr. B. F. Illston.....	Jamestown
Dr. L. D. Bowman.....	Jamestown
Dr. F. H. Nichols.....	Jamestown
Dr. J. R. Gillett.....	Kingston
Dr. L. K. Steele.....	Kingston
Dr. M. M. O'Meara.....	Kingston
Dr. Henry Van Hovenberg.....	Kingston
Dr. A. A. Stern.....	Kingston
Dr. Mary Gage-Day.....	Kingston
Dr. E. H. Loughran.....	Kingston
Dr. W. J. O'Leary.....	Kingston
Dr. P. B. Collier.....	Kingston
Dr. D. B. Hardenbergh.....	Middletown
Mrs. Dr. I. M. Wilson.....	Middletown
Dr. C. I. Redfield.....	Middletown
Dr. M. A. Stivers.....	Middletown
Dr. M. I. Beers.....	Middletown
Dr. T. O. Vanamee.....	Newburgh
Dr. John Deyo.....	Newburgh

Dr. Mary E. Dunning.....	Newburgh
Dr. W. Stanton Gleason.....	Newburgh
Dr. John T. Howell.....	Newburgh
Dr. Andrew V. Jova.....	Newburgh
Dr. E. O. Mitchell.....	Newburgh
Dr. Edward Thompson	Newburgh
Dr. Charles E. Townsend.....	Newburgh
Dr. W. H. Snyder.....	Newburgh
Dr. Antonio Stella.....	New York
Dr. A. E. Smith.....	Olean
Dr. J. Ross Allen.....	Olean
Dr. Casson Smith.....	Olean
Dr. J. E. K. Morris.....	Olean
Dr. Benjamin Van Campen.....	Olean
Dr. Walter A. Cowell.....	Olean
Dr. William H. Mountain.....	Olean
Dr. Mary B. Jepson.....	Olean
Dr. E. H. Torrey.....	Olean
Dr. J. P. Booth.....	Olean
Dr. Thomas B. Loughlen.....	Olean
Dr. H. S. Albertson.....	Oswego
Dr. C. A. Sheridan.....	Oswego
Dr. J. K. Stockwell.....	Oswego
Dr. A. C. Calisch.....	Oswego
Dr. L. A. Thomas.....	Painted Post
Dr. R. W. Andrews (delivered lecture).....	Poughkeepsie
Dr. J. W. Poucher (delivered lecture).....	Poughkeepsie
Dr. F. A. Mann (delivered lecture).....	Poughkeepsie
Dr. L. H. Marks (delivered lecture).....	Poughkeepsie
Dr. Nelson Borst (delivered lecture).....	Poughkeepsie
Dr. J. H. Cotter (delivered lecture).....	Poughkeepsie
Dr. Grace M. Kimball (delivered lecture)	Poughkeepsie
Dr. A. L. Peckham (delivered lecture).....	Poughkeepsie
Dr. J. A. Card (delivered lecture).....	Poughkeepsie
Dr. L. C. Wood (delivered lecture).....	Poughkeepsie
Dr. J. H. M. Von Tilling (delivered lecture).....	Poughkeepsie
Dr. J. L. Heffron.....	Syracuse

Dr. W. D. Alsever.....	Syracuse
Dr. Frederick E. Easton.....	Syracuse
Dr. B. W. Sherwood.....	Syracuse
Dr. F. W. Sears.....	Syracuse
Dr. N. L. Mulvey.....	Syracuse
Dr. E. J. Wynkoop.....	Syracuse
Dr. H. B. Doust.....	Syracuse
Dr. John Van Duyen.....	Syracuse
Dr. C. E. Coon.....	Syracuse
Dr. H. L. Elsner.....	Syracuse
Dr. W. W. Waite.....	Syracuse
Dr. W. A. Curtin.....	Syracuse
Dr. J. H. Irish.....	Syracuse
Dr. George D. Lynch.....	Syracuse
Dr. W. G. Hinsdale.....	Syracuse
Dr. Francis J. Ryan.....	Syracuse
Dr. John J. Buettner.....	Syracuse
Dr. Clifford Mercer.....	Syracuse
Dr. C. S. Prest.....	Waterford
Dr. Henry Moffatt.....	Yonkers
Dr. William J. Vogeler.....	Yonkers
Dr. Francis Cohen.....	Yonkers
Dr. George P. Holden.....	Yonkers
Dr. E. S. Letty.....	Yonkers

In connection with the thirteen municipal campaigns there were held 168 public meetings, not including the medical meetings. The statistics in connection with these meetings are as follows:

Addresses by physicians.....	33
Illustrated lectures by physicians.....	152
Addresses by laymen.....	69
Addresses by clergymen (not including many sermons delivered in churches).....	35
Addresses by superintendents of schools.....	10
Addresses by mayors.....	18
Addresses by presidents of Central Labor Unions.....	8
Addresses by women.....	20

Lectures and addresses by staff of State Department of Health	16
Lectures and addresses by staff of State Charities Aid Association	28
	<hr/>
Total addresses and lectures	384
	<hr/> <hr/>

Three meetings were held in the Polish language, two in Italian and one each in German, Albanian, Swedish and French.

Respectfully submitted,

C. W. FETHEROLF,
Director State Traveling Tuberculosis Exhibition

REPORT
OF THE
ANTITOXIN LABORATORY

[315]

REPORT OF ANTITOXIN LABORATORY

HON. EUGENE H. PORTER, A.M., M.D., *State Commissioner of Health, Albany, N. Y.:*

SIR:— I have the honor to submit to you report of the work of the Antitoxin Laboratory for the year 1909.

The work of this portion of the laboratory services of the Department of Health herewith designated as the Antitoxin Laboratory corresponds to the group established by you in submitting the report of this year's work of the Department of Health to the Governor of this State, and is described by you in Group E of the work of the laboratory division, designated as follows: "Preparation and distribution of bacterial products, sera and therapeutic materials."

For purposes of comparison, the general statements of the activity of the antitoxin laboratory are made in tabular form corresponding to those of reports of this service in preceding years.

The total amount of diphtheria antitoxin distributed during 1909 consists of 24,429 bottles of diphtheria antitoxin of 1,500 units each or equivalent. The character and total number of places supplied during the year is shown in the following table which covers the period from 1902:

YEAR	1902	1903	1904	1905	1906	1907	1908	1909
Cities supplied	30	42	42	42	42	42	43	47
Villages supplied	161	204	617	691	793	828	926	169 273
Towns supplied	171	280						
Total	362	526	659	733	835	870	969	489

Of this amount of diphtheria antitoxin, a total of 36,643,500 units, the proper form of requisition has been filled in and is duly filed for 33,925,000 units, showing a balance of 2,718,500 units of diphtheria antitoxin distributed during that year in some manner other than the usual form of signed requisition. For 16,488,000 units of this year's distribution of diphtheria antitoxin, receipts in due form have been returned to this Department and are filed. Reports of the use of 13,500,725 units of diphtheria antitoxin more or less completely filled out and signed have been for-

warded to this Department and are on file. In addition thereto, 57,000 units of diphtheria antitoxin are represented by report slips received by the Laboratory perfectly blank, generally returned with a package containing an empty syringe of antitoxin and without any address of sender which would make the identification or trace of the antitoxin used in these cases.

Among the reports of diphtheria antitoxin utilized, it is found that this therapeutic agent was used in forty-two cases that were other than diphtheria.

Reports of the utilization of the State antitoxin are at hand for 1,823 cases of diphtheria, of which 1,235 recovered and 134 died — 454 cases with no termination indicated.

The mortality, therefore, of all reported cases of diphtheria with the use of the State antitoxin for 1909 is a trifle under 9.8 per cent.

Of the 134 deaths reported, sixty-two occurred in a very limited time following the first injection of antitoxin. It is generally accepted by the best authorities on the organic action of antitoxin in diphtheria that the proper saturation of the human organism treated with diphtheria antitoxin to assist the organic reaction of diphtheria infection is not obtained in less than fifteen hours after the injection of the proper quantities of antitoxin. And such authorities are quite agreed that statistics that shall rightly show the value of antitoxin treatment in diphtheria should have the gross mortality corrected by the deduction of all cases in which the survival of the patient was not for some interval longer than fifteen hours. To make then this requisite correction, sixty-two deaths from diphtheria must be subtracted from the gross mortality above mentioned, giving a corrected mortality of 5.3 per cent.

Of the deaths reported for the antitoxin service of 1909 subsequent to the deduction of those cases which did not survive the fifteen-hour period above described; of fifty-four cases sufficiently reporting the ages, six were under 2 years of age; the ages of twenty were between 2 and 5; of twenty-one between 5 and 18; six were over 18 years of age, and the age of one was not stated.

Of fifty-four cases reporting sufficient data for tabulation, five deaths occurred where the first injection was given the day following the appearance of the first symptoms; ten died when the

injection was given subsequent to the second day following the first symptoms; fourteen died where the injection was subsequent to three days following the appearance of the first injection; one failed to state the day of injection, and the remainder of the fifty-four lethal cases of this series, that is to say twenty-four cases of a series of fifty-four deaths, occurred where the antitoxin injection was made subsequent to the fourth day following the first symptoms of the disease. For the purposes of comparison these data are tabulated in the form of Table VI of the report of previous years.

YEARS	DAYS OF DISEASE OF FIRST INJECTION			
	First	Second	Third	Fourth and over
	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>
1902.....	3.2	6.6	9.4	21.2
1903.....	1.0	2.8	10.1	15.6
1904.....	.9	4.7	10.9	16.6
1905.....	2.3	5.0	5.1	18.1
1906.....	3.6	7.1	10.0	11.4
1907.....	3.4	3.6	13.4	10.5
1908.....	3.6	8.0	9.3	16.8
1909.....	9.3	18.5	27.8	44.4

The relative amount of the distribution of 1909 with that of previous years since 1902 is shown by the following table, which is a continuation of Table II of the reports of previous years:

	Bottles
Nine months of 1902.....	6,552
Full year, 1903.....	14,121
Full year, 1904.....	16,374
Full year, 1905.....	16,308
Full year, 1906.....	17,794
Full year, 1907.....	23,629
Full year, 1908.....	25,469
Full year, 1909.....	24,429

The average potency of the serum distributed has not exceeded 370 units per cubic centimeter. The relative strength of serum issued this year, compared to that of previous years, is shown in the following table:

1902.....	300 units per cubic centimeter
1903.....	325 units per cubic centimeter
1904.....	375 units per cubic centimeter
1905.....	350 units per cubic centimeter
1906.....	350 units per cubic centimeter
1907.....	450 units per cubic centimeter
1908.....	350 units per cubic centimeter
1909.....	370 units per cubic centimeter

Of all the cases reported, involving a total of over 13,000,000 units of diphtheria antitoxin, approximately 2,000,000 units of antitoxin were used for immunizing purposes, 10,000,000 units used for purposes of cure, and 1,250,000 units of antitoxin were used in lethal cases.

Special study of the most thoroughly reported series of antitoxins utilized during the year, showed that of 492 cases immunized 618,750 units of antitoxin were used, showing the utilization of an average dose of 1,250 units.

Of this same series of antitoxin utilization, 27 deaths were reported, for which 306,500 units of diphtheria antitoxin had been utilized, showing an administration of 11,350 units per case of the deaths reported.

Of 324 cases of reported recoveries in this same series, a total of 2,166,550 units are shown to have been utilized; an average amount of 6,686 units of antitoxin per case for those in this series that recovered from diphtheria.

By reason of special effort and study concentrated upon this last mentioned series, it is believed that the average dosage showing the relative number of cases immunized, of deaths, of recoveries, and the relative quantities of antitoxin utilized for these various groups of cases, represents most exactly the corresponding utilization of State antitoxin in cases of diphtheria during 1909.

Of all the cases of the use of antitoxin for insuring immunity from diphtheria, no failure to secure such immunity is reported on any slip in the possession of the Laboratory. One such case has, however, been reported to you and is the object of a special investigation elsewhere reported.

A considerable number of State institutions was supplied with both diphtheria and tetanus antitoxin. A total of more than 2,000,000 units of diphtheria antitoxin is reported as supplied during 1909 to State institutions, of which practically 300,000 units were supplied for purposes of immunization. Approximately, therefore, one and three-quarters million units were supplied for therapeutic use in these State institutions.

The New York State Agricultural and Industrial School at Industry, at the close of the year, was supplied with more than half a million units of diphtheria antitoxin by reason of an epidemic then prevailing, and still continuing into the next year. A similar but less severe situation occurred also in the New York State Reformatory at Elmira at the close of the year, still continuing into the next; but previous to the expiration of 1909, 150,000 units of diphtheria antitoxin had been supplied for that latter epidemic.

TETANUS ANTITOXIN

A very special effort was made by the Antitoxin Service preliminary to the accident period of the Fourth of July to supply as extensively as possible all health officers with tetanus antitoxin.

It is very noticeable that many health officers fail to keep antitoxins on hand, and tetanus antitoxin in particular; and the mortality statistics of the State from tetanus, showing 108 cases, do not indicate that a sufficiently extensive distribution or, at least, utilization of tetanus antitoxin exists.

A total of 6,369,500 units of tetanus antitoxin was distributed during the year, and requisitions to the amount of slightly over 5,000,000 units of such antitoxin are in proper form and duly filed. The form of requisition is lacking for 1,340,500 units of State antitoxin. The receipts required from such physicians as have utilized the State antitoxin are at hand and filed for 2,043,500 units of tetanus antitoxin, and reports of its use to the amount of 1,506,950 units have been received and filed.

Of actual cases of tetanus subjected to State antitoxin treatment, there are reported only 21 cases. Of these reports 6 are so deficient that the termination is unknown. Of the remaining 15, 10 deaths are reported and 5 recoveries.

It is respectfully submitted to you that in a matter so important as the preservation of human life from a tetanus infection, that much greater effort should be made to secure a widespread utilization of this so perfectly demonstrated efficient prophylactic measure for tetanus; and, furthermore, that the most energetic steps be taken that where an amount of over 6,000,000 units of tetanus is supplied by your Department, a far more complete report of its utilization by physicians throughout the State should be insisted upon and obtained.

Of 1,506,950 units for the utilization of which sufficient reports exist, it is found that a little more than half — 819,950 units of tetanus antitoxin — were used for prophylactic purposes, and that 687,000 units of such antitoxin were used for treating actual cases of tetanus.

Approximately 3,000,000 units of tetanus antitoxin were supplied to cities in the State, 2,000,000 units to towns and villages and 73,000 units of tetanus antitoxin were furnished to the State institutions.

Six hundred and fifty-nine towns, 281 villages and 2 cities in the State of New York did not receive any supply of tetanus antitoxin in 1909.

During the year 1909 the Laboratory Division was charged with the work of preparing and distributing the outfits furnished by the State Department of Health for the purpose of prophylaxis of ophthalmia neonatorum. Before the expiration of that year, the preliminary distribution of small quantities to every health officer was completed, and further and larger quantities were supplied as the demand and utilization of these outfits indicated the necessity.

The first distribution was not made until toward the close of the year, but up to the end of the year more than 20,000 of these outfits were distributed. It is expected that the proper utilization of this prophylactic service will require the preparation and distribution of at least 200,000 outfits per annum, and the Laboratory is prepared to meet demands to that amount without delay.

Respectfully submitted,

WILLIAM S. MAGILL,

Director of Laboratories

REPORT
OF THE
HYGIENIC LABORATORY

[323]

REPORT OF HYGIENIC LABORATORY

HON. EUGENE H. PORTER, M. D., *State Commissioner of Health,
Albany, N. Y.:*

SIR.—I have the honor to submit to you the report of the work of the Laboratory Division of the State Department of Health for the year 1909.

The lines of work of this division are naturally grouped in: A — Educational; B — Investigations for sanitary control of potable waters and foods; C — Diagnostic examinations for determination of infectious disease and control of quarantine; D — Special investigations; E — Preparation and distribution of bacterial products, sera and therapeutic materials.

In addition to the educational work inaugurated, which is fully described in your own report of the year's work, the Bacteriologist of the Laboratory attended the meeting of the Lake Keuka Medical Association in July, contributing to their programme an address on milk and at the annual Sanitary Conference the Acting Director contributed the first scientific paper of that meeting entitled, "New Methods in Diagnosis and Treatment of Infectious Diseases," and to the course of lectures on sanitary science, delivered under the direction of this Department at Cornell University, the Acting Director also lectured on the preparation and uses of antitoxins.

Under Group B — the routine investigations for purposes of sanitary control of potable waters and foods — comes the work of the State Laboratory at Albany and its branch establishment at Ithaca and functioning since September, 1909.

During the year the public water supplies of 244 communities have been examined and in many cases repeatedly examined, according to the resources of the Laboratory and the relative necessity of such repeated investigations to more thoroughly protect a community from a polluted water supply.

During the year 1909, 1,702 analyses or other laboratory examinations of water, have been made. Of these 1,056 were bacteriological and 646 were chemical analysis of water samples.

Of the 244 public water supplies investigated, 127 were sampled and the water thereof examined and reported upon once during the year. Sixty-seven public supplies were examined twice during the year; 27 three times, and 23 four times or more. The results of the Laboratory determinations have been tabulated and are herewith submitted.

Table of Analytical Results of Samples of Water Obtained from Public Supplies or Supplies used by Public Institutions

RESULTS IN PARTS PER MILLION

CITY, TOWN OR VILLAGE	Source	Date	Color	Turbidity	Residue on evaporation	Mineral residue	Nitrogen as —				Chlorine	Hardness, Total	Alkalinity	Oxygen consumed	Bacteria per c.c.	B. Coli Type (+ = Present) (- = Absent)			
							Free ammonia	Albuminoid ammonia	Nitrites	Nitrates						10 c.c.	1 c.c.	1-10 c.c.	1-100 c.c.
Addison	Tap public supply	1/19/9	1	5	178	128	.024	.054	.004	1.20	12	95.7	93.0	1.30	41,000	+	+	+	—
Addison	Tap public supply	5/4/9	12	36	61	42	.012	.122	.002	0.24	1.00	18.2	9.0	4.50	7,000	+	+	+	—
Addison	Tap public supply	12/18/9	14	5	263	172	.002	.032	.003	0.36	10.75	137.2	137.2	1.03	110,000	+	+	+	—
Albany	Tap public supply	2/1/9	1	1	99	70	.042	.088	Trace	0.50	1.62	50.7	39.5	6.30	750	+	+	+	—
Albany	Public supply passing through Blessing filter at capitol building	2/1/9	17	Clear	94	67	.026	.092	Trace	0.60	1.62	49.3	40.0	6.40	250	—	—	—	—
Albany	Tivoli gravity supply	4/12/9	10	30	158	114	.014	.276	.003	0.40	6.12	90.0	68.0	4.70	800	+	+	+	—
Albany	Massachusetts reservoir, gravity supply	4/12/9	17	30	270	196	.006	.168	.002	1.20	6.62	148.6	144.0	2.20	1,500	+	+	+	—
Albany	Raw water at filter plant	4/12/9	16	45	183	159	.008	.145	.002	0.30	1.25	37.7	31.0	7.00	13,000	+	+	+	+
Albany	Raw water well at filter plant	4/12/9	13	Clear	75	47	.004	.092	Trace	0.40	1.00	37.7	31.0	4.20	44	+	+	+	—
Albany	Effluent filter, No. 1	4/12/9	...	...	...	...	...	...	...	...	...	...	...	...	46	+	+	+	—
Albany	Effluent filter, No. 8	4/12/9	...	...	...	...	...	...	...	...	...	...	...	...	55	+	+	+	—
Albany	Effluent filter, No. 8	4/12/9	7	7	69	68	.012	.172	.001	0.00	3.37	60.0	54.0	4.95	250	+	+	+	—
Albany	Renesslaire lake supply	5/20/9	22	15	97	67	.034	.170	.005	0.20	1.87	60.0	51.0	7.00	4,500	+	+	+	—
Albany	Raw water Hudson river	5/20/9	...	...	...	...	...	...	...	...	...	...	...	...	210	+	+	+	—
Albany	Pre-filter effluent	5/20/9	19	Clear	69	62	.008	.080	.003	0.40	1.62	58.6	48.5	4.60	130	+	+	+	—
Albany	Pure water well, filtered water	5/20/9	20	5	119	85	.015	.246	.001	Trace	4.00	78.0	60.0	5.00	425	+	+	+	—
Albany	Renesslaire lake supply	5/22/9	20	8	...	...	.038	.174	.003	0.10	4.00	62.9	52.0	9.50	1,400	+	+	+	+
Albany	Raw water Hudson river	7/0/9	20	8	...	...	...	...	...	...	...	...	...	...	200	+	+	+	+
Albany	Pre-filter effluent	7/0/9	15	Trace	11	58	.008	.090	.001	0.06	3.00	60.0	52.0	7.75	7	+	+	+	+
Albany	Pure water well	7/0/9	...	...	...	...	...	...	...	...	...	...	...	...	150	+	+	+	—
Albany	Renesslaire lake supply	7/0/9	10	8	127	88	.008	.168	.002	Trace	2.75	57.1	54.0	4.75	400	+	+	+	—
Albany	Tivoli gravity supply	7/0/9	12	30	197	165	.010	.212	.003	0.20	5.00	70.0	64.5	6.00	800	+	+	+	—
Albany	Raw Hudson river water	9/29/9	30	7	147	82	.022	.144	.006	0.10	6.50	60.0	52.5	9.00	5,900	+	+	+	+
Albany	Pre-filter effluent	9/29/9	...	...	...	...	...	...	...	...	...	...	...	...	32	+	+	+	—
Albany	Pure water well at filter plant	9/29/9	20	Clear	147	81	.018	.072	.002	0.10	5.50	56.7	51.0	7.50	85	+	+	+	—
Albany	New well for public supply	1/21/9	2,200	+	+	+	—

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RESULTS IN PARTS PER MILLION — (Continued).

CITY, TOWN OR VILLAGE	Source	Date	Color	Turbidity	Residue on evapora- tion	Mineral residue	NITROGEN AS —				Chlorine	Hardness, Total	Alkalinity	Oxygen consumed	Bacteria per c. c.	B. Coxi Type (+ = Pasteur) (— = Anasaz)			
							Free ammonia	Albuminoid ammonia	Nitrates	Nitrates						10 c.c.	1 c.c.	1-10 c.c.	1-100 c.c.
Bath	Tap, public supply	12/6/9	0	1	208	191	.000	.006	.001	0.00	4.00	190.0	...	0.64	50	+	+	+	...
Belmont	Tap, public supply	1/20/9	3	2	87	61	.002	.072	Trace	0.50	1.50	58.6	47.0	1.60	2,500	+	+	+	...
Benns Pt., State Fish Hatchery	Chautauqua lake, off shore	9/17/9	1	2	61	45	.010	.186	.001	Trace	1.12	40.3	32.0	3.20	200	+	+	+	...
Benns Pt., State Fish Hatchery	From pump	9/17/9	...	...	...	...	...	...	...	...	...	...	...	...	1,700	+	+	+	...
Berlin	Effluent from gravel filter	6/17/9	...	...	...	...	...	...	...	...	...	...	...	...	3,700	+	+	+	...
Berlin	Tap, public supply	8/13/9	18	3	46	28	.008	.124	.002	0.04	0.25	20.8	14.0	4.30	91,525	+	+	+	...
Binghamton	Stream	8/13/9	5	6	88	50	.018	.122	.002	0.80	3.50	38.0	28.5	2.90	200,000	+	+	+	...
Binghamton	Raw water (river and wells)	1/14/9	...	...	...	...	...	...	...	...	...	...	...	...	3,500	+	+	+	...
Binghamton	Mixed effluents	1/14/9	...	...	...	...	...	...	...	...	...	...	...	...	22	+	+	+	...
Binghamton	Driven well at State Hospital	2/18/9	Trace	Clear	241	196	.020	.080	.001	2.40	11.50	148.6	106.0	0.40	7,700	+	+	+	...
Binghamton	Raw water (river and well)	2/26/9	10	80	65	38	.038	.190	.001	0.50	2.87	36.4	28.0	4.10	300	+	+	+	...
Binghamton	Filtered water	2/28/9	...	...	...	...	...	...	...	...	...	...	...	...	1,400	+	+	+	...
Binghamton	Raw water	6/6/9	3	15	80	54	.012	.114	.002	0.40	3.60	39.0	30.5	3.00	15	+	+	+	...
Binghamton	Mixed effluents	5/6/9	Trace	Clear	...	...	.014	.032	.001	0.28	2.75	37.7	16.5	0.65	180	+	+	+	...
Black River	Drakes creek, proposed supply No. 1	6/4/9	...	...	...	...	...	...	...	...	...	...	...	...	650	+	+	+	...
Black River	Drakes creek, proposed supply No. 2	6/4/9	...	...	...	...	...	...	...	...	...	...	...	...	1,800	+	+	+	...
Black River	Drakes creek, proposed supply No. 3	6/4/9	3	3	128	115	.012	.054	.001	0.60	1.37	97.2	94.5	1.90	1,600	+	+	+	...
Black River	Drakes creek, proposed supply No. 4	6/4/9	Trace	Clear	209	152	.022	.016	.001	1.80	1.62	140.0	130.0	0.10	16	+	+	+	...
Bliss	Tap, public supply	6/10/9	Trace	Clear	115	100	.014	.012	.002	0.10	1.62	51.4	51.5	0.20	19,500	+	+	+	...
Bolivar	Tap, public supply	7/9/9	1	1	115	100	.014	.012	.002	0.10	1.62	51.4	51.5	0.20	8,600	+	+	+	...
Bolivar	McDermott spring	7/9/9	...	...	...	...	...	...	...	...	...	...	...	...	30,000	+	+	+	...
Bolivar	Feet spring	7/9/9	...	...	...	...	...	...	...	...	...	...	...	...	7,000	+	+	+	...
Bolivar	Pumping wells	7/9/9	Trace	1	246	159	.080	.064	.001	2.40	14.75	97.1	64.0	0.65	30,000	+	+	+	...
Brewster	Tap, public supply, Avery system	...	...	...	...	...	...	...	...	...	...	...	...	...	7,000	+	+	+	...
Brewster	Tap, public supply, old system	2/12/9	Clear	Clear	...	...	.018	.042	.002	0.10	1.50	77.1	73.0	0.40	1,100	+	+	+	...
Brewster	Driven well, 250 feet, public supply	2/12/9	Clear	Clear	...	...	.042	.112	.004	0.40	3.50	20.8	17.5	0.30	275	+	+	+	...
Brewster	Spring entering reservoir	...	...	...	...	...	...	...	...	...	...	...	...	...	1,900	+	+	+	...
Brewster	Pump house well. Open well 30 feet deep	2/12/9	Trace	Trace	...	...	.018	.090	.004	0.80	3.00	52.9	28.5	0.40	6,000	+	+	+	...
Brewster	Tap, public supply	2/12/9	Clear	Clear	...	...	.016	.074	.002	0.24	1.80	45.7	43.0	0.75	1,900	+	+	+	...

[illegible]

RESULTS IN PARTS PER MILLION — (Continued).

CITY, TOWN OR VILLAGE	Source	Date	Color	Turbidity	Residue on evaporation	Mineral residue	Nitrogen as—				Chlorine	Hardness, Total	Alkalinity	Oxygen consumed	Bacteria per c. c.	B. Coli Type (+=Passant) (—=Absent)			
							Free ammonia	Albuminoid ammonia	Nitrites	Nitrates						10 c.c.	1 c.c.	1-10 c.c.	1-100 c.c.
Champlain	Tap, public supply	3/29/9	35	2	88	82	.112	.206	.004	0.40	1.50	39.0	27.0	7.15	4,600	+	+	+	+
Charlotte	Raw water from Lake Ontario.	3/4/9	3	140	161	125	.038	.222	.003	0.24	9.00	87.1	85.0	6.90	22,500	+	+	+	+
Charlotte	Filtered water	3/4/9	1	1	153	114	.002	.156	.001	0.10	6.50	87.1	87.0	3.45	1,800	+	+	+	+
Charlotte	Raw water, municipal supply	5/19/9	2	40	161	122	.078	.026	.001	4.00	10.50	81.4	53.0	0.50	75	+	+	+	+
Charlotte	Filtered water	5/19/9	2	Trace	117	82	.018	.042	.004	3.20	6.25	51.4	41.0	0.60	28	+	+	+	+
Chatham	Tap, public supply	4/29/9	Trace	Clear	137	96	.004	.020	.001	3.20	6.50	70.0	50.5	0.10	90	+	+	+	+
Chatham	Dug well, public supply	5/11/9	Trace	Clear	137	96	.004	.020	.001	3.20	6.50	70.0	50.5	0.10	22	+	+	+	+
Chatham	Driven well, public supply	5/11/9	Trace	Clear	137	96	.004	.020	.001	3.20	6.50	70.0	50.5	0.10	22	+	+	+	+
Chatham	Well, public supply	9/12/9	65	7	18,105	15,465	4.340	.594	Trace	Trace	8300.0	300.0	183.0	77.00	200	+	+	+	+
Chester	Tap, public supply	4/9/9	7	2	37	19	.012	.138	.001	0.04	1.87	16.9	10.0	2.45	65	+	+	+	+
Clayton	St. Lawrence, 100 feet from shore	9/24/9	7	7	37	19	.012	.138	.001	0.04	1.87	16.9	10.0	2.45	500	+	+	+	+
Clayton	Tap in Dr. Frame's office, village supply	9/24/9	7	7	37	19	.012	.138	.001	0.04	1.87	16.9	10.0	2.45	375	+	+	+	+
Clayton	Tap in pumping plant	9/24/9	7	7	37	19	.012	.138	.001	0.04	1.87	16.9	10.0	2.45	375	+	+	+	+
Clayton	St. Lawrence, over mouth of intake	9/24/9	7	7	37	19	.012	.138	.001	0.04	1.87	16.9	10.0	2.45	375	+	+	+	+
Clifton Springs	Tap, village supply	3/16/9	1	2	307	249	.002	.400	Trace	4.00	4.37	235.5	226.0	0.40	140	+	+	+	+
Clinton	Tap, village supply	11/17/9	5	1	701	517	.002	.024	.001	0.01	5.62	271.5	270.5	0.41	275	+	+	+	+
Clinton	Tap, public supply	4/8/9	1	28	323	274	.010	.058	.001	0.80	2.62	137.2	107.5	1.25	2,200	+	+	+	+
Clinton	Tap, public supply	9/28/9	1	28	323	274	.010	.058	.001	0.80	2.62	137.2	107.5	1.25	2,200	+	+	+	+
Clyde	Tap, public supply	3/2/9	Trace	Clear	352	290	.044	.042	.001	Trace	1.50	205.0	136.5	0.95	32	+	+	+	+
Coblekill	Tap, public supply	3/18/9	4	45	90	62	.064	.172	.004	1.20	1.25	41.6	30.0	3.10	900	+	+	+	+
Coblekill	Tap, public supply	10/21/9	10	11	84	55	.006	.148	.002	Trace	0.75	44.3	36.0	5.30	210	+	+	+	+
Coeys	Tap, public supply	6/20/9	22	2	69	44	.008	.164	.001	Trace	0.25	36.1	27.0	5.30	3,100	+	+	+	+
Coeys	Reservoir, public supply	1/6/9	12	6	150	119	.240	.126	.005	0.20	4.25	78.6	70.0	7.20	6,800	+	+	+	+
Coeys	Tap at pumping station	3/15/9	11	20	114	83	.028	.134	.004	0.30	2.62	62.9	54.0	6.20	71,000	+	+	+	+
Coeys	Tap at pumping station	4/19/9	25	30	86	59	.020	.162	.002	0.20	1.37	42.9	36.0	6.10	800	+	+	+	+
Coeys	Tap at pumping station	5/25/9	14	13	121	93	.038	.136	.005	0.08	2.25	74.3	68.0	4.90	1,600	+	+	+	+
Coeys	Tap at pumping station	6/11/9	25	13	123	87	.072	.172	.005	0.07	0.10	5.25	94.3	8.10	1,600	+	+	+	+
Coeys	Tap at pumping station	7/7/9	20	18	154	119	.014	.172	.007	0.10	5.25	94.3	79.5	7.45	17,500	+	+	+	+
Coeys	Reservoir No. 3	8/13/9	23	2	170	124	.018	.130	.003	0.20	6.50	95.7	84.0	6.50	900	+	+	+	+
Coeys	Tap at pumping station	10/12/9	22	5	169	104	.012	.150	.008	0.20	6.75	96.4	92.0	8.40	900	+	+	+	+
Coeys	Tap at pumping station	10/12/9	22	5	169	104	.012	.150	.008	0.20	6.75	96.4	92.0	8.40	900	+	+	+	+
Cold Spring	Tap, public fountain	6/17/9	Trace	Clear	211	124	.002	.016	.002	8.00	13.87	125.8	64.0	0.20	110	+	+	+	+

[illegible]

RESULTS IN PARTS PER MILLION — (Continued)

CITY, TOWN OR VILLAGE	Source	Date	Color	Turbidity	Residue on evapora- tion	Mineral residue	Nitrogen as—				Chlorine	Hardness, Total	Alkalinity	Oxygen consumed	Bacteria per c.c.	B. Coli Type (+ = Present) (- = Absent)			
							Free ammonia	Albuminoid ammonia	Nitrites	Nitrates						10 c.c.	1 c.c.	1-10 c.c.	1-100 c.c.
Earville.....	Tap, public supply.....	6/17/9	5	3	51	35	.006	.122	.001	0.04	0.37	32.5	22.0	3.00	27,500	—	—	—	—
East Amora.....	Tap, public supply.....	3/8/9	Trace	Clear	280	240	.070	.118	.004	0.80	5.75	228.5	171.0	0.30	50	—	—	—	—
East Syracuse.....	Tap, public supply.....	3/8/9	1	13	227	189	.020	.170	.003	2.00	2.00	131.4	—	2.55	225	+	+	—	—
East Syracuse.....	Tap, public supply.....	6/25/9	1	15	207	207	.010	.054	.002	1.60	1.60	206.0	184.0	1.65	—	+	+	—	—
East Syracuse.....	Tap, public supply.....	11/20/9	5	1	276	240	.002	.020	.001	.80	1.62	235.5	—	1.35	190	+	+	—	—
Ellenville.....	Tap, public supply.....	2/8/9	1	Clear	32	19	.056	.064	Trace	Trace	1.12	9.5	4.0	1.15	28	+	+	—	—
Ellenville.....	Public well.....	7/20/9	1	Clear	32	19	.056	.064	Trace	Trace	1.12	9.5	4.0	1.15	28	+	+	—	—
Ellenville.....	South Gully brook.....	9/5/9	1	Clear	32	19	.056	.064	Trace	Trace	1.12	9.5	4.0	1.15	28	+	+	—	—
Elmira.....	Raw water, city filters.....	9/5/9	2	4	130	92	.052	.076	.002	0.80	4.25	75.7	54.0	2.00	13,500	+	+	—	—
Elmira.....	Mixed effluents, city filters.....	1/18/9	Trace	1	136	103	.032	.044	.002	0.80	4.25	75.7	32.0	1.10	26,000	+	+	—	—
Elmira.....	Reservoir at State reformatory.....	2/24/9	Trace	1	136	103	.032	.044	.002	0.80	4.25	75.7	32.0	1.10	4,000	+	+	—	—
Elmira.....	State reformatory, raw water.....	3/3/9	10	220	76	56	.150	.342	.003	1.20	2.25	37.1	7.0	5.00	3,300	+	+	—	—
Elmira.....	Effluent, State reformatory, filters.....	3/3/9	10	220	76	56	.150	.342	.003	1.20	2.25	37.1	7.0	5.00	3,100	+	+	—	—
Elmira.....	Raw water, city filters.....	3/3/9	8	60	62	41	.030	.132	.002	0.80	1.12	29.9	12.0	3.80	800	+	+	—	—
Elmira.....	Mixed effluents, city filters.....	5/5/9	Trace	Clear	62	41	.008	.036	.002	0.80	1.25	29.6	1.0	0.55	130,000	+	+	—	—
Elmira.....	Effluent unit No. 15, city filters.....	5/5/9	Trace	Clear	62	41	.008	.036	.002	0.80	1.25	29.6	1.0	0.55	10	+	+	—	—
Elmira.....	Effluent unit No. 15, city filters.....	5/5/9	Trace	Clear	62	41	.008	.036	.002	0.80	1.25	29.6	1.0	0.55	13	+	+	—	—
Elmira.....	Same supply as Elmira.....	5/5/9	Trace	Clear	62	41	.008	.036	.002	0.80	1.25	29.6	1.0	0.55	15	+	+	—	—
Elmira Heights.....	Tap, public supply.....	12/8/9	1	2	241	213	.018	.006	.008	Trace	3.62	177.2	—	0.28	16	—	—	—	—
Endicott.....	Tap, public supply.....	3/3/9	Trace	Clear	434	372	.010	.088	.001	2.00	1.75	264.5	165.5	0.15	15	—	—	—	—
Fairport.....	Tap, public supply.....	3/3/9	Trace	Clear	434	372	.010	.088	.001	2.00	1.75	264.5	165.5	0.15	15	—	—	—	—
Fayetteville.....	Tap, public supply.....	11/20/9	3	5	434	380	.002	.010	.002	0.80	2.50	214.5	1.45	0.15	25	—	—	—	—
Fayetteville.....	Tap, public supply.....	2/26/9	5	5	434	380	.002	.010	.002	0.80	2.50	214.5	1.45	0.15	95	—	—	—	—
Falkland-Hud'a.....	Tap, public supply.....	2/15/9	1	Trace	240	196	.026	.040	.001	0.40	1.25	189.5	0.85	1.60	170	—	—	—	—
Fonda.....	Tap, public supply.....	4/5/9	1	Trace	174	144	.010	.052	.001	0.80	1.12	145.8	140.0	1.10	4,900	—	—	—	—
Fonda.....	Tap, public supply.....	10/18/9	5	9	186	136	.016	.026	.008	2.40	3.00	125.8	124.0	1.15	120	+	+	—	—
Fonda.....	Tap, public supply.....	1/5/9	2	8	84	53	.058	.036	.005	1.60	5.00	32.5	19.0	1.30	800	+	+	—	—
Fonda.....	Tap, Taylor system.....	1/5/9	1	Clear	36	25	.064	.034	.001	0.36	0.62	22.1	9.0	1.00	130	+	+	—	—
Fort Edward.....	Tap, municipal system.....	8/31/9	1	Clear	36	25	.064	.034	.001	0.36	0.62	22.1	9.0	1.00	130	+	+	—	—
Fort Edward.....	Reservoir at water works.....	8/31/9	12	2	128	108	.010	.080	.001	0.10	0.37	88.6	88.0	3.50	35	—	—	—	—
Fort Plain.....	Tap, public supply.....	6/30/9	6	1	106	89	.010	.104	.001	0.36	0.16	59.3	58.5	2.05	180	+	+	—	—
Frankfort.....	Tap, public supply.....	2/17/9	10	10	75	56	.048	.140	.001	0.16	0.75	33.8	31.0	2.65	5,300	+	+	—	—
Frankfort.....	Tap, public supply.....	4/6/9	10	10	132	110	.012	.078	.001	0.04	0.87	100.0	91.0	2.30	1,500	+	+	—	—
Frankfort.....	Tap, public supply.....	6/29/9	10	4	132	110	.012	.078	.001	0.04	0.87	100.0	91.0	2.30	1,500	+	+	—	—

* Acidity.

[illegible]

• Acidity

RESULTS IN PARTS PER MILLION — (Continued).

CITY, TOWN OR VILLAGE	Source	Date	Color	Turbidity	Residue on evapora- tion	NITROGEN AS —				Chlorine	Hardness, Total	Alkalinity	Oxygen consumed	Bacteria per c.c.	B. Coll. Type (+ = Present) (— = Absent)		
						Free ammonia	Albuminoid ammonia	Nitrites	Nitrates						10 c.c.	1 c.c.	1-10 c.c.
Green Island	Tap, No. 2 George street.	2/ 4/9												115	+	+	+
Green Island	Raw water.	3/12/9	13	2	295	5.100	0.240	.003	0.50	18.50	160.0	153.5	2.65	160	+	+	+
Green Island	Mixed effluents.	3/12/9	1	Trace	273	4.800	0.210	.001	0.50	18.50	160.0	150.0	1.80		+	+	+
Green Island	East filter.	3/12/9												34	+	+	+
Green Island	West filter.	3/12/9												130	+	+	+
Green Island	Tap, No. 2 George street.	3/12/9												220	+	+	+
Green Island	Raw water.	4/ 9/9	11	1	213	5.400	0.300	.002	0.50	15.00	137.2	135.0	2.60		+	+	+
Green Island	Mixed effluents.	4/ 9/9	1	9	216	5.100	0.220	.001	0.50	15.50	131.4	128.0	2.00		+	+	+
Green Island	East filter.	4/ 8/9												180	—	—	—
Green Island	West filter.	4/ 8/9												183	—	—	—
Green Island	Raw water.	4/19/9	13	15		4.800	.270	.003	0.50	12.50	134.2	135.0	2.00	1,500	+	+	+
Green Island	Mixed effluents.	4/19/9	2	Clear		5.100	.140	.002	0.50	13.00	131.4	131.0	1.45		—	—	—
Green Island	East filter.	4/19/9													—	—	—
Green Island	West filter.	4/19/9												85	—	—	—
Green Island	Raw water.	5/11/9	20	1	225	5.700	.120	.002	0.60	12.50	134.2	136.0	2.30	10	+	+	+
Green Island	Mixed effluents.	5/11/9	Trace	5		5.100	.150	Trace	0.60	12.50	128.6	119.0	1.90		+	+	+
Green Island	East filter.	5/11/9													—	—	—
Green Island	West filter.	5/11/9												13	+	+	+
Green Island	Raw water.	6/21/9	12	3	214	5.100	.190	.003	0.20	17.00	121.4	130.0	4.15	19	+	+	+
Green Island	Mixed effluents.	6/21/9	Trace	Clear		5.100	.170	.002	0.20	17.00	131.4	115.0	1.65	120	+	+	+
Green Island	East filter.	6/21/9												21	+	+	+
Green Island	Tap, public supply	10/20/9	Trace	Clear	245	6.900	.140	Trace	0.80	20.00	131.4	120.0	2.30	55	+	+	+
Green Island	Tap, public supply	12/21/9	2	1	250	3.500	.100	.003	0.60	20.75	134.2	122.0	4.00	160	+	+	+
Green Island	Supplementary supply, artesian well.	6/10/9	Trace	2	161	126	.002	.008	1.60	2.50	120.0	111.0	0.35	98	+	+	+
Green Island	Driveway well, public supply	7/12/9	Trace	Trace	79	66	.002	.001	0.20	10.00	45.0	45.0	0.20	190	+	+	+
Green Island	Tap, public supply	6/21/9	1	1	162	143	.004	.038	0.01	0.70	1.37	125.8	118.0	1.70	550	+	+
Green Island	Odd well, public supply	10/22/9	Trace	20	343	268	.206	.042	.005	2.00	16.75	182.5	64.0	0.70	120	+	+
Green Island	Well in village, public supply	10/22/9	Trace	Clear	325	273	.006	.038	0.01	11.50	290.0	189.0	0.30	120	+	+	+
Green Island	Tap, public supply	4/ 8/9	1	Clear	184	157	.014	.052	.001	0.40	1.75	146.6	146.0	0.90	41	+	+
Green Island	Hydrant, dead end	3/23/9												2,500	—	—	—
Green Island	Hydrant on direct main	3/23/9												1,000	—	—	—
Green Island	Hydrant, fire plug	3/23/9												10,000	—	—	—
Harrison	Harrison																
Harrison	Harrison																

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RESULTS IN PARTS PER MILLION — (Continued).

CITY, TOWN OR VILLAGE	Source	Date	Color	Turbidity	Residue on evapora- tion	Mineral residue	Nitrogen as —				Chlorine	Hardness, Total	Alkalinity	Oxygen consumed	Bacteria per c.c.	B. Coll. Type (+ = Presumptive) (— = Absent)			
							Free ammonia	Albuminoid ammonia	Nitrates	Nitrites						10 c.c.	1 c.c.	1-10 c.c.	1-100 c.c.
Kingston	Tap, public supply, high service.	4/14/9	2	5	46	36	.186	.126	.001	.04	1.25	29.9	23.0	1.55	325	+	+	+	+
Kingston	Tap, public supply, high service.	7/12/9	2	1	40	27	.004	.068	.001	.04	1.00	17.6	16.0	1.30	90	+	+	+	+
Kingston	Tap, public supply, low service.	7/12/9	2	1	148	112	.016	.124	.003	.10	7.62	88.6	82.5	2.25	130	+	+	+	+
Lancaster	Public supply from Lake Erie.	5/22/9	1	25	474	382	.090	.154	.001	.70	8.62	285.5	212.0	3.30	350	+	+	+	+
Leroy	Tap, public supply.	3/18/9	10	3	474	382	.090	.154	.001	.70	8.62	285.5	212.0	3.30	350	+	+	+	+
Leroy	High School well.	3/18/9	Trace	Clear	819	710	.004	.038	.007	.04	6.50	614.0	283.0	1.30	26	+	+	+	+
Leroy	Tap, public supply.	6/17/9	Trace	Clear	686	612	.010	.186	.001	Trace	335.00	114.2	67.0	5.00	26	+	+	+	+
Leroy	Water from upper mill pond.	8/ 3/9	9	3	686	612	.010	.186	.001	Trace	335.00	114.2	67.0	5.00	26	+	+	+	+
Leroy	Ice from lower mill pond.	8/ 3/9	Trace	Clear	259	183	.070	.126	.002	3.20	9.12	166.8	155.0	.40	4,200	+	+	+	+
Lesterhire	Tap, public supply.	1/14/9	Trace	Clear	259	183	.070	.126	.002	3.20	9.12	166.8	155.0	.40	4,200	+	+	+	+
Little Falls	Tap, public supply.	2/18/9	5	8	126	105	.036	.112	.001	.24	.62	90.0	58.0	2.00	13	+	+	+	+
Little Falls	Tap, public supply.	4/ 5/9	5	10	105	82	.018	.082	.001	.30	.25	77.1	74.0	2.00	700	+	+	+	+
Little Falls	Tap, public supply.	6/29/9	5	35	135	115	.018	.064	.001	.30	1.00	114.2	102.0	1.85	2,400	+	+	+	+
Little Falls	Well or spring on King farm.	8/ 2/9	Trace	Clear	135	115	.018	.064	.001	.30	1.00	114.2	102.0	1.85	7,500	+	+	+	+
Little Falls	Spring No. 2 on King farm.	8/ 2/9	Trace	Clear	135	115	.018	.064	.001	.30	1.00	114.2	102.0	1.85	7,500	+	+	+	+
Little Falls	Brook tributary to Beaver brook.	8/ 2/9	Trace	Clear	135	115	.018	.064	.001	.30	1.00	114.2	102.0	1.85	7,500	+	+	+	+
Little Falls	Small stream tributary to Beaver brook.	8/ 2/9	Trace	Clear	135	115	.018	.064	.001	.30	1.00	114.2	102.0	1.85	7,500	+	+	+	+
Little Falls	Tap, public supply.	10/18/9	25	14	122	96	.008	.050	.003	.10	.75	81.4	79.0	1.70	3,200	+	+	+	+
Little Falls	Tap, public supply.	3/ 5/9	Trace	8	135	106	.014	.104	Trace	.04	6.87	74.3	79.0	1.70	76,000	+	+	+	+
Lockport	Tap, public supply.	5/18/9	2	40	140	108	.012	.240	.002	.20	7.25	80.0	79.5	2.35	80,000	+	+	+	+
Lockport	Tap, City Building, public supply.	5/18/9	Trace	Trace	133	96	.008	.066	.003	Trace	6.25	90.0	87.0	.90	1,000	+	+	+	+
Lockport	Tap, City Hospital, public supply.	9/21/9	Trace	Trace	133	96	.008	.066	.003	Trace	6.25	90.0	87.0	.90	1,000	+	+	+	+
Lockport	Tap, Old Fellows Home, public supply.	9/21/9	Trace	Trace	133	96	.008	.066	.003	Trace	6.25	90.0	87.0	.90	1,000	+	+	+	+
Lockport	Filtered water, well and river water.	9/21/9	Trace	Trace	133	96	.008	.066	.003	Trace	6.25	90.0	87.0	.90	1,000	+	+	+	+
Lyons	Tap, public supply (mixture of river and well).	3/ 3/9	23	25	341	259	.042	.170	.004	1.60	12.75	145.8	131.0	5.55	2,100	+	+	+	+
Lyons	Mud creek raw water.	3/ 3/9	15	13	818	679	.018	.156	.005	1.30	210.00	271.5	159.0	3.85	1,200	+	+	+	+
Lyons	Public supply (mixture of well and in- filtrated river water).	5/20/9	28	10	324	249	.033	.262	.003	.40	5.50	165.8	160.5	11.00	9,400	+	+	+	+
Marion	Tap, public supply.	5/20/9	23	7	1,518	1,283	.066	.186	.006	1.60	512.50	378.5	215.5	4.90	3,400	+	+	+	+
Malone	Tap, public supply.	6/17/9	Trace	Clear	145	107	.070	.145	.010	1.10	40.00	111.4	110.5	1.10	110	+	+	+	+
Malone	Tap, public supply.	3/20/9	Trace	Clear	112	92	.010	.026	.002	1.20	.87	88.6	79.0	.35	250	+	+	+	+
Massena	Raw water.	4/27/9	Trace	Clear	112	92	.010	.026	.002	1.20	.87	88.6	79.0	.35	110	+	+	+	+

Filtered water		4/27/9	1	20	139	109	010	006	002	008	6.25	91.4	87.0	2.90	22
Massena	Tap, public supply	11/26/9	Trace	5	34	21	002	000	.002	.04	2.12	6.3	1.0	1.80	170
Mattawa	State Hospital, artesian well No. 1	11/26/9	Trace	5	230	220	360	004	.075	.04	15.75	102.8	148.0	3.96	74,000
Mattawa	State Hospital, artesian well No. 1	12/9/9	Trace	15	333	250	394	076	.003	.04	7.50	228.5	220.0	3.96	45,000
McMillan	Tap, public supply	1/22/9	Trace	200	177	125	012	034	Trace	.04	7.50	17.2	98.5	1.10	29,000
McMillan	Tap, public supply	1/25/9	Trace	2	148	121	014	034	.004	.04	6.75	117.2	86.0	1.10	160
McMillan	Tap, public supply	5/12/9	Trace	34	93	63	014	180	Trace	.04	1.50	88.9	44.0	7.60	1,000
McMillan	Tap, public supply	5/6/9	Trace	15	93	301	016	038	Trace	.04	9.52	271.5	185.5	2.30	1,200
McMillan	Tap, public supply	5/25/9	Trace	6	57	39	028	048	Trace	.04	50	29.9	27.0	2.30	230
McMillan	Raw water, highland source	4/19/9	3	10	39	22	020	166	.001	.04	1.25	19.5	7.0	2.10	950
McMillan	Filtered water, highland source	4/19/9	3	10	39	22	020	166	.001	.04	1.25	19.5	7.0	2.10	950
McMillan	Filtered water, Monaghan reservoir	4/19/9	6	3	50	28	022	238	Trace	.04	1.25	23.4	14.0	3.80	300
McMillan	Filtered water, Monaghan reservoir	1/21/9	1	5	119	104	030	174	.002	1.00	1.02	87.1	80.5	.90	2,100
McMillan	Driven well	1/7/9	Trace	Clear	110	90	018	022	.003	.40	1.87	85.7	82.6	.40	8,000
McMillan	Tap, public supply	4/29/9	Trace	Clear	209	177	038	074	.001	.30	2.50	140.0	139.0	.10	230
McMillan	Tap, public supply	2/18/9	Trace	Clear	201	177	026	022	.001	.70	3.12	135.8	131.5	.38	40
McMillan	Tap, public supply	4/6/9	Trace	Clear	196	175	002	014	.001	.00	2.75	102.8	140.6	.45	18
McMillan	Tap, public supply	6/15/9	Trace	Clear	202	171	006	014	.001	.00	2.75	102.8	140.6	.45	18
McMillan	Tap, public supply	10/19/9	Trace	Clear	27	12	032	116	.001	.04	1.87	4.8	2.0	2.08	350
McMillan	Tap, public supply	4/20/9	2	5	132	99	068	138	.010	.80	2.75	68.6	60.0	2.90	6,000
McMillan	Tap, public supply	1/16/9	7	10	132	99	068	138	.010	.80	2.75	68.6	60.0	2.90	6,000
McMillan	Tap, public supply	11/10/9	6	1	180	135	024	346	Trace	15.36	780.00	97.1	90.0	6.00	50
McMillan	Village well, public supply	8/16/9	10	2											
McMillan	Public supply, north main	4/26/9													30
McMillan	Public supply, south main	4/26/9													15
McMillan	Public supply, depot, west end	4/26/9													60
McMillan	Public supply, Dr. Brundow's office	4/26/9													75
McMillan	Hydrant, public supply	4/26/9													15,000
McMillan	Well about 1 miles from proposed new supply	2/5/9													
Mount Morris	Chichester well about 1 miles from proposed new supply	3/12/9	Trace	2	302	286	044	102	.005	2.40	20.50	107.2	137.0	.95	
Mount Morris	Well on Chichester farm	3/30/9	3	90	435	341	008	114	.080	3.20	20.50	263.0	190.0	2.15	220
Mount Morris	Well No. 1	8/13/9	2	Trace	333	344	006	014	.008	2.80	21.00	264.0	176.0	.45	2,000
Mount Morris	Well No. 2	8/21/9	Trace	36	458	283	012	030	.002	1.00	20.50	235.5	145.0	.30	1,900
Mount Morris	Chichester well, No. 1	8/25/9	1	12	408	286	004	004	.002	1.20	54.00	228.5	210.0		90
Mount Morris	3 driven wells on Swan street	8/30/9	1	240	250	221	006	006	.002	1.80	2.50	221.0	212.0		3,000
Mount Morris	Well, proposed supply	10/7/9	1	Clear	414	319	016	014	Trace	3.20	14.75	293.0	270.0	.80	
Mount Morris	Filtered water, Mamaronock river	10/28/9	6	8	81	50	042	128	.004	.70	5.50	32.5	21.0	2.90	2,000
Mount Morris	Well, proposed supply	10/28/9	6	Clear	81	50	042	128	.004	.70	5.50	32.5	21.0	2.90	2,000
Mount Vernon	Raw water, Mamaronock river	2/23/9	1	5	83	45	024	122	.006	.50	4.62	36.1	26.0	2.70	2,000
Mount Vernon	Filtered water, Mamaronock river	2/23/9	6	5	83	45	024	122	.006	.50	4.62	36.1	26.0	2.70	2,000
Mount Vernon	Raw water, Mamaronock river	4/26/9	6	5	83	45	024	122	.006	.50	4.62	36.1	26.0	2.70	2,000
Mount Vernon	Filtered water, Mamaronock river	4/26/9	6	5	83	45	024	122	.006	.50	4.62	36.1	26.0	2.70	2,000
Mount Vernon	Pellham plant, filtered water	2/25/9	12	3	108	73	018	106	.002	1.40	6.25	38.0	23.5	2.90	120
Mount Vernon	Raw water, Pellham filter	4/27/9	3	Clear	146	107	010	008	.001	1.20	7.25	51.4	47.0	1.10	3,100
Mount Vernon	Pure water well, Pellham filter	4/27/9	3	Clear	146	107	010	008	.001	1.20	7.25	51.4	47.0	1.10	3,100

Nyack	4/15/9	17	3	78	53	006	120	001	0.14	3.25	33.8	28.0	3.90	1,400
Odell system, tap	4/15/9	5	Trace	137	99	010	060	001	0.80	4.87	78.6	75.0	1.45	16
Municipal well, tap	3/29/9	Trace	139	178	024	060	060	003	0.50	14.25	148.6	140.0	0.50	65
Tap, public supply	5, 5/9	15	177	148	014	060	060	003	0.40	9.87	108.0	107.0	1.05	1,100
City supply (flood from river over wells)	5/13/9	Trace	10	232	189	022	058	004	0.40	15.00	105.0	145.0	0.40	600
City supply (wells in flooded district)	5/13/9	1	13	225	195	044	060	001	0.40	15.00	151.4	140.0	0.85	220
City supply	5/17/9	1	20	221	179	034	120	003	0.40	13.50	140.0	138.0	1.90	55
City supply	5/24/9	1	20	221	179	034	120	003	0.40	13.50	140.0	138.0	1.90	55
City supply	8/15/9	1	1	217	189	025	032	045	0.60	13.75	154.2	145.0	0.70	12,000
Cook well	8/30/9	Trace	1	163	140	022	094	001	0.20	11.50	114.2	110.0	1.00	50,000
City Hall	9/27/9	Trace	218	184	012	024	024	003	0.50	29.50	145.8	145.0	0.20	500
Tap, City Hall	9/27/9	Trace	218	184	012	024	024	003	0.50	29.50	145.8	145.0	0.20	500
Tap, City Hall	9/27/9	Trace	218	184	012	024	024	003	0.50	29.50	145.8	145.0	0.20	500
Tap, public supply	11/30/9	Trace	225	205	022	078	078	003	0.40	17.50	102.0	176.0	0.50	90
Tap, public supply	12/30/9	Trace	229	195	008	088	088	001	0.60	17.00	102.5	190.0	0.90	170
Tap, public supply	6/25/9	5	888	753	022	102	102	001	0.36	7.62	571.0	178.0	2.70	41,000
Raw water	1/12/9	8	38	22	036	118	002	001	0.50	1.17	15.5	5.0	3.05	9,000
Mixed filter effluents	1/12/9	8	38	22	036	118	002	001	0.50	1.17	15.5	5.0	3.05	9,000
Effluent unit, No. 5	1/12/9	8	38	22	036	118	002	001	0.50	1.17	15.5	5.0	3.05	9,000
Effluent unit, No. 6	1/12/9	8	38	22	036	118	002	001	0.50	1.17	15.5	5.0	3.05	9,000
Raw water	3/23/9	4	31	22	540	072	Trace	Trace	0.20	1.00	14.3	3.0	0.55	13
Mixed effluents	3/23/9	4	31	22	540	072	Trace	Trace	0.20	1.00	14.3	3.0	0.55	13
Effluent, filter No. 3	5/24/9	4	35	21	026	104	Trace	Trace	0.04	0.75	20.8	10.0	2.65	800
Raw water	5/24/9	4	35	21	026	104	Trace	Trace	0.04	0.75	20.8	10.0	2.65	800
Mixed filter effluents	5/24/9	4	35	21	026	104	Trace	Trace	0.04	0.75	20.8	10.0	2.65	800
Effluent, unit No. 2	5/24/9	5	41	23	008	062	001	001	0.10	0.62	19.5	8.0	3.00	200
Effluent, unit No. 3	5/24/9	5	41	23	008	062	001	001	0.10	0.62	19.5	8.0	3.00	200
Raw water	10/21/9	6	10	40	23	008	062	001	0.10	0.62	19.5	8.0	3.00	200
Mixed effluents, Nos. 5 and 6	10/21/9	6	10	40	23	008	062	001	0.10	0.62	19.5	8.0	3.00	200
Effluent, filter No. 5	10/21/9	6	10	40	23	008	062	001	0.10	0.62	19.5	8.0	3.00	200
Effluent, filter No. 6	10/21/9	6	10	40	23	008	062	001	0.10	0.62	19.5	8.0	3.00	200
Joe, Douglas supply	7/17/9	1	5	244	217	006	018	001	0.40	1.00	214.5	215.0	0.60	240
Oriskany Falls	7/17/9	1	5	244	217	006	018	001	0.40	1.00	214.5	215.0	0.60	240
Oriskany Falls	7/17/9	1	5	244	217	006	018	001	0.40	1.00	214.5	215.0	0.60	240
Tap, public supply	2/25/9	7	12	60	40	044	158	Trace	0.10	2.37	18.2	14.5	4.30	3,800
Tap, city supply	2/16/9	15	7	415	325	108	176	003	0.30	92.00	180.0	86.0	6.40	2,800
Tap, city supply	4/19/9	12	17	300	224	042	162	005	0.30	53.50	194.2	75.0	4.95	16,500
Tap, public supply	5/31/9	Trace	126	101	002	064	001	001	0.50	6.37	85.7	85.0	0.15	29
Tap, public supply, from excavated wells	1/15/9	Trace	126	101	002	064	001	001	0.50	6.37	85.7	85.0	0.15	29
Raw water and alum	5, 5/9	Trace	55	43	Trace	Trace	Trace	Trace	0.30	1.00	23.4	*	1.30	200
Filter effluents	5, 5/9	Trace	55	43	Trace	Trace	Trace	Trace	0.30	1.00	23.4	*	1.30	200
Raw water	6/21/9	Trace	53	39	020	168	092	010	1.00	20.8	7.0	2.55	230	36,000
Effluent, south east filter	6/21/9	2	1	53	39	020	168	092	0.10	20.8	7.0	2.55	230	36,000
Tap, public supply	1/14/9	Trace	88	41	002	060	002	010	1.20	1.12	39.0	32.0	0.50	3,600
Tap, public supply	6/21/9	Trace	66	48	002	016	002	080	0.90	0.75	33.5	0.20	180	3,600
Tap, public supply	12/14/9	Trace	140	110	036	068	003	003	0.60	2.50	113.0	2.40	3,100	3,100
Chenango river water	12/14/9	Trace	46	012	210	010	010	010	0.60	2.50	113.0	2.40	3,100	3,100
New eastern	12/14/9	Trace	46	012	210	010	010	010	0.60	2.50	113.0	2.40	3,100	3,100
Reservoir	12/14/9	Trace	86	64	006	012	012	012	1.30	0.75	47.1	36.0	0.30	190

* Acid to lardoloid.

• Acid to lacticoid.

RESULTS IN PARTS PER MILLION — (Continued).

CITY, TOWN OR VILLAGE	Source	Date	Color	Turbidity	Residue on evapora- tion	Mineral residue	Nitrogen as —				Chlorine	Hardness, Total	Alkalinity	Oxygen consumed	Bacteria per c.c.	B. Coll. Type (+ = Pasteur) (- = Assaut)			
							Free ammonia	Albuminoid ammonia	Nitrites	Nitrates						10 c.c.	1 c.c.	1-10 c.c.	1-100 c.c.
Palmyra...	Tap, public supply	3/2/9	Trace	Clear	311	255	.014	.002	.001	3.20	5.00	221.5	207.0	0.36	18	-	-	-	-
Palmyra...	Upper well, public supply	8/23/9													11	-	+	+	+
Palmyra...	Town well, public supply	8/23/9													5,200	+	+	+	+
Palmyra...	New spring, public supply	8/23/9													14,000	+	+	+	+
Palmyra...	Private well	4/23/9													500,000	+	+	+	+
Palmyra...	Tap, public supply	1/7/9	10	Trace	813	478	8.100	24.130	.760	80.00	120.00	188.5	16.5	8.40					
Palmyra...	Tap, public supply	4/23/9	10	Trace	113	90	.000	.110	.002	0.10	1.75	72.9	69.0	1.90					
Palmyra...	Tap, public supply	4/23/9	10	Trace	72	52	.014	.028	.002	0.20	1.62	50.0	41.0	1.65	1.100	+	+	+	+
Palmyra...	Tap, public supply	1/10/9	18	1	88	63	.024	.138	.003	0.20	2.87	57.1	34.0	4.30	9,300	+	+	+	+
Palmyra...	Tap, public supply	2/26/9	18	4	51	29	.026	.230	.002	0.10	2.87	42.9	12.0	4.90	750	+	+	+	+
Palmyra...	Stream north of Lake Michigan	4/25/9													23,000	+	+	+	+
Palmyra...	Outlet of Lake Michigan	4/25/9													3,800	+	+	+	+
Palmyra...	Small brook east of Lake Michigan	4/25/9													86,000	+	+	+	+
Palmyra...	Tap, public supply	4/26/9	23	5	62	22	.014	.132	.001	0.46	1.87	27.3	17.5	4.80					
Palmyra...	Tap, public supply	1/16/9	2	2	117	91	.033	.106	.003	0.14	2.60	72.9	70.0	1.80	150				
Palmyra...	Tap, public supply	3/25/9	2	Clear	256	210	.008	.060	.001	4.00	2.37	196.0	187.0	0.96	450				
Palmyra...	Tap, public supply	6/14/9	Trace	Clear	290	215	.002	.028	.001	4.80	2.25	203.0	188.0	0.10	42				
Palmyra...	Tap, public supply	12/10/9	3	1	296	267	.018	.018	.002	0.40	3.50	257.0		1.19					
Palmyra...	Tap, public supply	4/1/9	4	Trace	62	52	.012	.058	.001	0.04	0.25	32.5	28.0	1.00	160				
Palmyra...	Tap, public supply	1/6/9	3	2	22	24	.020	.132	.001	0.04	1.12	19.5	8.0	2.20	210				
Palmyra...	Tap, public supply	4/26/9	3	2	37	15	.012	.170	.003	0.04	1.00	13.4	8.5	3.20	47				
Palmyra...	Tap, public supply	3/16/9	Trace	Clear	274	223	.010	.056	.001	1.40	22.12	221.5	175.0	0.40	950				
Palmyra...	Tap, public supply	3/29/9	10	Clear	114	87	.028	.076	.001	0.30	0.37	88.6	84.0	2.20	1,000	+	+	+	+
Palmyra...	Tap, public supply	3/29/9	1	Trace	150	110	.060	.052	.002	0.20	0.50	102.8	100.0	1.50	1,300	+	+	+	+
Palmyra...	Lower reservoir	9/25/9	27	130	103	66	.060	.228	.003	0.16	3.25	40.3	18.0	8.00	40,500	+	+	+	+
Palmyra...	Raw water	1/8/9													65				
Palmyra...	Filtered water	4/27/9	Trace	Clear	84	73	.010	.034	.002	0.30	2.62	22.1	6.0	0.50	8				
Palmyra...	Tap, public supply	3/2/9	2	Clear	125	125	.042	.158	.005	0.80	2.50	110.0	101.5	2.00	9,800	+	+	+	+
Palmyra...	Tap, public supply	3/2/9	4	4	44	25	.068	.170	.006	0.10	3.12	11.1	8.5	4.28	475				
Palmyra...	Tap, public supply	2/25/9	10	7	144	25	.013	.132	.002	0.30	2.37	108.6	106.0	0.66	650				
Palmyra...	Tap, Withelbes-Sherman system	3/25/9	12	12	78	50	.012	.132	.002	0.30	2.37	108.6	106.0	0.66	650				
Palmyra...	Tap, municipal supply	3/25/9	12	2	78	50	.012	.132	.002	0.30	2.37	108.6	106.0	0.66	650				
Palmyra...	Tap, municipal supply	4/19/9	2	2	38	21	.012	.064	.002	0.04	1.12	4.8	2.0	1.70	1,200	+	+	+	+
Palmyra...	Tap, municipal supply	10/25/9	Trace	2	31	21	.002	.064	.002	None	1.50	16.9	13.0	1.90	15,000	+	+	+	+
Palmyra...	Nevernak river	10/25/9	Trace	2	31	21	.002	.064	.002	None	1.50	16.9	13.0	1.90	2,100	+	+	+	+
Palmyra...	Reservoir No. 1	10/25/9	5	Clear	36	18	.004	.174	.002	Trace	1.25	11.1	6.0	5.20	1,130				

Port Jervis	10/25/93	Trace	2	46	36	.002	.014	.001	1.00	35.8	24.0	0.50	750
Twp. public supply	9/4/93	Trace	2	—	—	.034	.218	.002	0.16	48.6	20.0	8.20	73,000
Bortville	4/22/93	24	80	—	—	—	—	—	—	—	—	—	6,600
Boughton	4/22/93	24	80	—	—	—	—	—	—	—	—	—	82
Boughton	4/22/93	24	80	—	—	—	—	—	—	—	—	—	30
Boughton	4/22/93	24	80	—	—	—	—	—	—	—	—	—	30
Boughton	4/22/93	24	80	—	—	—	—	—	—	—	—	—	30
Boughton	4/22/93	24	80	—	—	—	—	—	—	—	—	—	30
Boughton	4/22/93	24	80	—	—	—	—	—	—	—	—	—	30
Boughton	4/22/93	24	80	—	—	—	—	—	—	—	—	—	30
Boughton	4/22/93	24	80	—	—	—	—	—	—	—	—	—	30
Boughton	4/22/93	24	80	—	—	—	—	—	—	—	—	—	30
Boughton	4/22/93	24	80	—	—	—	—	—	—	—	—	—	30
Boughton	4/22/93	24	80	—	—	—	—	—	—	—	—	—	30
Boughton	4/22/93	24	80	—	—	—	—	—	—	—	—	—	30
Boughton	4/22/93	24	80	—	—	—	—	—	—	—	—	—	30
Boughton	4/22/93	24	80	—	—	—	—	—	—	—	—	—	30
Boughton	4/22/93	24	80	—	—	—	—	—	—	—	—	—	30
Boughton	4/22/93	24	80	—	—	—	—	—	—	—	—	—	30
Boughton	4/22/93	24	80	—	—	—	—	—	—	—	—	—	30
Boughton	4/22/93	24	80	—	—	—	—	—	—	—	—	—	30
Boughton	4/22/93	24	80	—	—	—	—	—	—	—	—	—	30
Boughton	4/22/93	24	80	—	—	—	—	—	—	—	—	—	30
Boughton	4/22/93	24	80	—	—	—	—	—	—	—	—	—	30
Boughton	4/22/93	24	80	—	—	—	—	—	—	—	—	—	30
Boughton	4/22/93	24	80	—	—	—	—	—	—	—	—	—	30
Boughton	4/22/93	24	80	—	—	—	—	—	—	—	—	—	30
Boughton	4/22/93	24	80	—	—	—	—	—	—	—	—	—	30
Boughton	4/22/93	24	80	—	—	—	—	—	—	—	—	—	30
Boughton	4/22/93	24	80	—	—	—	—	—	—	—	—	—	30
Boughton	4/22/93	24	80	—	—	—	—	—	—	—	—	—	30
Boughton	4/22/93	24	80	—	—	—	—	—	—	—	—	—	30
Boughton	4/22/93	24	80	—	—	—	—	—	—	—	—	—	30
Boughton	4/22/93	24	80	—	—	—	—	—	—	—	—	—	30
Boughton	4/22/93	24	80	—	—	—	—	—	—	—	—	—	30
Boughton	4/22/93	24	80	—	—	—	—	—	—	—	—	—	30
Boughton	4/22/93	24	80	—	—	—	—	—	—	—	—	—	30
Boughton	4/22/93	24	80	—	—	—	—	—	—	—	—	—	30
Boughton	4/22/93	24	80	—	—	—	—	—	—	—	—	—	30
Boughton	4/22/93	24	80	—	—	—	—	—	—	—	—	—	30
Boughton	4/22/93	24	80	—	—	—	—	—	—	—	—	—	30
Boughton	4/22/93	24	80	—	—	—	—	—	—	—	—	—	30
Boughton	4/22/93	24	80	—	—	—	—	—	—	—	—	—	30
Boughton	4/22/93	24	80	—	—	—	—	—	—	—	—	—	30
Boughton	4/22/93	24	80	—	—	—	—	—	—	—	—	—	30
Boughton	4/22/93	24	80	—	—	—	—	—	—	—	—	—	30
Boughton	4/22/93	24	80	—	—	—	—	—	—	—	—	—	30
Boughton	4/22/93	24	80	—	—	—	—	—	—	—	—	—	30
Boughton	4/22/93	24	80	—	—	—	—	—	—	—	—	—	30
Boughton	4/22/93	24	80	—	—	—	—	—	—	—	—	—	30
Boughton	4/22/93	24	80	—	—	—	—	—	—	—	—	—	30
Boughton	4/22/93	24	80	—	—	—	—	—	—	—	—	—	30
Boughton	4/22/93	24	80	—	—	—	—	—	—	—	—	—	30
Boughton	4/22/93	24	80	—	—	—	—	—	—	—	—	—	30
Boughton	4/22/93	24	80	—	—	—	—	—	—	—	—	—	30
Boughton	4/22/93	24	80	—	—	—	—	—	—	—	—	—	30
Boughton	4/22/93	24	80	—	—	—	—	—	—	—	—	—	30
Boughton	4/22/93	24	80	—	—	—	—	—	—	—	—	—	30
Boughton	4/22/93	24	80	—	—	—	—	—	—	—	—	—	30
Boughton	4/22/93	24	80	—	—	—	—	—	—	—	—	—	30
Boughton	4/22/93	24	80	—	—	—	—	—	—	—	—	—	30
Boughton	4/22/93	24	80	—	—	—	—	—	—	—	—	—	30
Boughton	4/22/93	24	80	—	—	—	—	—	—	—	—	—	30
Boughton	4/22/93	24	80	—	—	—	—	—	—	—	—	—	30
Boughton	4/22/93	24	80	—	—	—	—	—	—	—	—	—	30
Boughton	4/22/93	24	80	—	—	—	—	—	—	—	—	—	30
Boughton	4/22/93	24	80	—	—	—	—	—	—	—	—	—	30
Boughton	4/22/93	24	80	—	—	—	—	—	—	—	—	—	30
Boughton	4/22/93	24	80	—	—	—	—	—	—	—	—	—	30
Boughton	4/22/93	24	80	—	—	—	—	—	—	—	—	—	30
Boughton	4/22/93	24	80	—	—	—	—	—	—	—	—	—	30
Boughton	4/22/93	24	80	—	—	—	—	—	—	—	—	—	30
Boughton	4/22/93	24	80	—	—	—	—	—	—	—	—	—	30
Boughton	4/22/93	24	80	—	—	—	—	—	—	—	—	—	30
Boughton	4/22/93	24	80	—	—	—							

RESULTS IN PARTS PER MILLION — (Continued).

CITY, TOWN OR VILLAGE	Source	Date	Color	Turbidity	Residue on evapora- tion	Mineral residue	Nitrogen as				Chlorine	Hardness, Total	Alkalinity	Oxygen consumed	Bacteria per c.c.	B. Col. Type (+ = Pus-forming) (- = Absent)			
							Free ammonia	Albuminoid	Nitrites	Nitrates						10 c.c.	1 c.c.	1-10 c.c.	1-100 c.c.
Rome	Tap, Washington avenue	12/21/9	1	Clear	158	118	.130	.068	.003	0.20	4.75	69.3	64.0	9.10	1,400	++	++	++	1-100 c.c.
Rome	Effluent, filter unit No. 3	12/21/9													1,650	++	++	++	1-100 c.c.
Rome	Effluent, filter unit No. 4	12/21/9													1,750	++	++	++	1-100 c.c.
Richford	Tap, public supply	6/22/9	1	2	43	32	.002	.068	.001	0.60	0.75	20.8	16.5	0.50	62,000	++	++	++	1-100 c.c.
Richmondville	Tap, public supply	8/19/9	1	8	55	30	.018	.120	.001	0.12	0.87	24.7	17.0	1.35	1,450	++	++	++	1-100 c.c.
Richmondville	Tap, public supply	8/19/9	Trace	5	112	82	.004	.030	.003	0.04	2.50	75.7	71.0	0.95	1,210	++	++	++	1-100 c.c.
Rome	City supply, filtered at Y. M. C. A. building	10/21/9													550	+	+	+	1-100 c.c.
Rome	Public supply, police station	1/4/9				41	.012	.204	.003	0.20	1.00	35.1	28.0	6.00	140,000	+	+	+	1-100 c.c.
Rome	Public supply, White's hotel	4/14/9	10	200	69	62	.004	.092	.001	0.10	1.75	88.6	53.0	4.80	2,300	++	++	++	1-100 c.c.
Rome	Public supply, Byrne's hotel	6/15/9	17	15	85	62	.004	.092	.001	0.10	1.75	88.6	53.0	4.80	2,300	++	++	++	1-100 c.c.
Rome	Public supply, Jarvis library	6/15/9													5,400	++	++	++	1-100 c.c.
Rome	Public supply, Lewis	6/15/9																	1-100 c.c.
Rome	Private well, plant of Wire and Tele- phone Company	7/29/9	1	2	586	469	.010	.028	.013	4.00	27.75	471.5	192.0	0.25	45	-	-	-	1-100 c.c.
Rome	Samples of ice from Wheat Bros. ice plant	8/20/9													50	-	-	-	1-100 c.c.
Rome	Samples of ice from ice plant of Henry A. Reed, Philip Thron	8/21/9													475	++	++	++	1-100 c.c.
Rome	Tap, Metalite Rod-and-Factory	10/25/9	Trace	Trace	200	165	.332	.028	Trace	Trace	28.25	140.0	130.0	0.20		+	+	+	1-100 c.c.
Round Lake	Tap, public supply	8/12/9	2	1	104	87	.006	.042	Trace	0.16	0.75	70.0	66.5	1.15	450	++	++	++	1-100 c.c.
Round Lake	Tap, public supply	11/29/9													350	++	++	++	1-100 c.c.
Round Lake	Tap, public supply	11/29/9													450	++	++	++	1-100 c.c.
Rouses Point	Tap, public supply	8/29/9	11	2	81	56	.028	.136	.001	0.44	1.12	40.3	37.0	3.80	2,500	++	++	++	1-100 c.c.
Sag Harbor	Tap, public supply	9/25/9	25	1	70	45	.068	.172	.001	0.02	9.50	15.6	13.5	3.20	10,600	++	++	++	1-100 c.c.
Sandy Hill	Tap, public supply	1/21/9	Trace	3	143	109	.002	.030	.001	0.60	4.75	85.7	81.5	0.25	110	+	+	+	1-100 c.c.
Saratoga Springs	Tap, public supply	1/8/9	Clear	8	186	166	.016	.042	.003	1.60	4.25	37.7	31.5	2.10	800	+	+	+	1-100 c.c.
Saratoga Springs	Tap, public supply	1/8/9	Clear	1	170	94	.078	.094	.006	0.24	1.50	74.3	72.0	1.40	70	+	+	+	1-100 c.c.
Saratoga Springs	Tap, public supply	8/12/9	2	1	78	64	.016	.058	Trace	0.10	1.12	58.6	53.0	1.50	15	-	-	-	1-100 c.c.
Saratoga Springs	Canned drinking fountain	11/8/9													450	-	-	-	1-100 c.c.
Saratoga Springs	Tap, public supply	12/8/9													60	+	+	+	1-100 c.c.
Saugerties	Tap, public supply	2/10/9	3	Trace	23	25	.040	.080	.001	0.10	1.50	4.8	2.00	1.20	230	+	+	+	1-100 c.c.
Saugerties	Tap, public supply	10/26/9	Trace	1	23	13	.008	.026	.002	0.30	1.50	11.1	8.00	0.80	1,000	+	+	+	1-100 c.c.

[illegible]

RESULTS IN PARTS PER MILLION — (Continued).

CITY, TOWN OR VILLAGE	Source	Date	Color	Turbidity	Residue on evaporation	Mineral residue	NITROGEN AS —				Chlorine	Hardness, Total	Alkalinity	Oxygen consumed	Bacteria per c.c.	B. Coli Type (+ = Present) (- = Absent)			
							Free ammonia	Albuminoid ammonia	Nitrites	Nitrates						10 c.c.	1 c.c.	1-10 c.c.	1-100 c.c.
Sonyea, Craig Col. for Epileptics	Tap in hospital, institutional supply	9/14/9													2,300	-	-	-	-
Sonyea, Craig Col. for Epileptics	Tap, "Villa Flora"	9/14/9													425	-	-	-	-
So. Glens Falls	Tap, public supply	1/5/9	2	Clear	63	50	.016	.028	.002	1.40	2.00	31.2	19.0	0.80		-	-	-	-
Spring Valley	Tap, public supply	4/16/9	Trace	Clear	111	77	.014	.032	.002	1.20	2.75	76.3	78.5	0.10	44	+	+	+	+
St. Johnsville	Tap, public supply	2/18/9	1	Clear	130	117	.026	.054	.001	0.40	0.50	111.4	103.5	0.40	3,200	+	+	+	+
Suffern	Lake Antrim	1/8/9	27	Clear	60	41	.014	.144	.002	0.10	2.12	20.8	10.6	5.50	7,000	+	+	+	+
Suffern	After passing through gravel bank but before passing through charcoal bed	1/8/9													9,200	+	+	+	+
Suffern	Tap in pumping station	1/8/9													10,500	+	+	+	+
Suffern	Lake Antrim, raw water	4/16/9													10,500	+	+	+	+
Suffern	Tap in pumping station	4/16/9	27	2	61	40	.016	.118	.001	0.04	2.62	23.4	19.0	6.30	10,500	+	+	+	+
Suffern	Lake Antrim	6/16/9	5	5	102	61	.044	.140	.003	0.04	2.37	69.3	65.0	2.80	1,400	+	+	+	+
Suffern	Tap, public supply	6/16/9													1,400	+	+	+	+
Syracuse	Drilled well, Syracuse State Institution for Feeble-Minded Children	5/10/9	Trace	2	813	683	.008	.012	.001	3.60	15.00	433.5	268.0	0.20	700	+	+	+	+
Tarrytown	Raw water	2/24/9	3	7	67	43	.036	.152	.001	0.06	4.37	42.9	25.5	1.80	450	+	+	+	+
Tarrytown	Tap, high pressure service	2/24/9													350	+	+	+	+
Tarrytown	Tap, low pressure service	2/24/9	2	Clear	76	49	.018	.132	.004	0.20	4.62	42.9	23.0	1.80	120	+	+	+	+
Tarrytown	Tarrytown lake, raw water	4/26/9	1	Clear	—	—	.004	.054	.002	0.20	4.37	45.7	17.0	1.05	950	+	+	+	+
Tarrytown	Tap, low pressure service	4/26/9													31	+	+	+	+
Tarrytown	Raw water, public supply	4/26/9													75	+	+	+	+
Tarrytown	Tap, high pressure service	6/17/9	1	Clear	82	57	.002	.104	.002	0.08	5.12	40.3	22.0	1.20	65	+	+	+	+
Tarrytown	Mixed effluents, high and low service	6/17/9													17	+	+	+	+
Tarrytown	Tap, low pressure service	6/17/9													31	+	+	+	+
Tarrytown	Tap, high pressure service	6/17/9													160	+	+	+	+
Tivoli	Clayhall stream														250	+	+	+	+
Tivoli	Driven well														225	+	+	+	+
Tonawanda	Tap, public supply	3/6/9	Trace	10	140	113	.024	.100	.001	0.04	6.50	91.4	91.5	1.75	1,200	+	+	+	+
Tonawanda	Tap, public supply	5/17/9	Trace	40	146	112	.012	.146	.003	0.20	7.25	81.4	79.0	2.80	1,400	+	+	+	+
Troy	Tap, high service	1/5/9	4	9	64	44	.040	.196	.001	0.06	1.75	29.9	20.0	4.05	1,000	+	+	+	+
Troy	Tap, low service	1/5/9	7	8	71	47	.280	.222	.014	0.36	1.50	33.1	32.0	4.75	1,000	+	+	+	+

Twp. high service.	2, 8, 9, 10	12	5	75	46	034	241	001	0.30	1.93	31.2	15.0	4.95	700
Twp. low service.	2, 8, 9, 10	12	10	75	60	343	277	004	0.40	2.37	32.5	15.0	4.90	9,400
Twp. high service.	3, 15, 9, 10	13	10	66	42	042	172	004	0.30	2.00	29.9	13.5	4.70	1,800
Twp. low service.	3, 15, 9, 10	13	10	66	42	042	172	002	0.30	1.62	29.9	13.5	4.70	1,800
Twp. high service.	5, 11, 9, 10	4	11	66	43	038	184	Trace	0.26	1.37	31.2	16.0	3.80	1,000
Twp. low service.	5, 11, 9, 10	4	20	66	43	038	200	003	0.26	1.12	31.4	16.0	3.80	1,000
Twp. high service.	8, 20, 9, 10	10	10	62	42	064	190	006	0.06	1.25	29.0	12.0	3.20	700
Twp. low service.	8, 20, 9, 10	10	10	62	42	064	190	006	0.06	1.25	29.0	12.0	3.20	700
Twp. low service.	1, 20, 9, 10	6	5	57	38	060	104	007	0.10	1.25	29.9	27.0	3.60	240
Lee from Requisite pond														43
Lee from Requisite pond														15
Martin Brook reservoir	1, 13, 9	5	3	38	23	038	078	002	0.80	1.37	15.9	5.0	2.35	960
Killmaney reservoir	1, 13, 9	5	3	33	23	032	048	002	0.20	1.12	19.5	7.5	2.35	660
Martin Brook system tap	5, 3, 9	5	1	24	15	004	080	002	0.14	0.60	14.3	5.5	2.30	425
Killmaney system tap	5, 3, 9	1	1	24	15	014	038	002	0.10	0.62	14.3	8.0	1.25	10,000
Public supply	6, 21, 9													2,100
Twp. public supply	6, 21, 9	30	2	45	26	030	144	001	0.20	0.25	14.3	11.5	5.50	400
Twp. in Consolidated Water Company's office	4, 2, 9													275
Twp. probably from West Canada creek supply	4, 2, 9	35	Trace	50	30	020	082	001	0.20	0.75	23.4	17.0	4.35	320
Twp. West Canada creek supply	6, 25, 9	37	2	48	26	004	084	001	0.10	0.62	20.8	15.0	5.80	200
Twp. public supply	6, 9, 9	10	5	75	47	036	156	002	0.04	3.37	46.7	29.0	4.10	300
Twp. public supply	2, 18, 9	2	10	121	020	074	022	0.40	1.25	95.7	87.5	0.80	460	
Twp. public supply	4, 21, 9	1	Clear	271	204	010	022	002	2.40	182.8	132.0	0.10	22	
Pumping station No. 2	11, 4, 9	Trace		270	205	022	022	Trace	1.20	6.75	171.4	153.0	0.10	140
Public supply, new system.	7, 14, 9	5	3	136	108	006	004	001	0.20	1.82	97.8	92.5	2.05	90
Public supply, old system.	7, 14, 9													130
Twp. public supply	4, 17, 9	22	15	60	45	010	040	001	0.24	2.04	24.7	19.0	1.90	9,900
Twp. public supply	3, 25, 9	28	15	58	49	018	144	002	0.04	4.03	28.0	16.30	1.00	1,000
Twp. public supply	6, 16, 9	34	20	75	40	004	182	002	0.04	1.25	36.4	26.5	13.80	13,500
Twp. public supply	3, 25, 9	20	40	207	128	040	200	005	1.00	28.00	81.4	78.0	5.35	180
Twp. public supply	4, 16, 9													4,400
Twp. public supply	11, 17, 9	2	20	241	213	016	142	005	0.00	108.6	64.0	1.40	4,400	
Dunbach's Ferry, raw water.	2, 5, 9	18	8	136	96	064	168	004	0.30	3.12	72.9	64.0	7.40	4,800
Sedimentation basin	2, 5, 9													4,800
Twp. high service.	2, 5, 9	12	12											4,900
Twp. high service.	2, 5, 9	15	15											2,900
Twp. high service.	3, 12, 9	13	17	131	86	026	128	002	0.40	2.00	69.9	55.0	4.55	2,900
Twp. high service.	3, 12, 9	13	20			042	108	003	0.40	2.00	64.3	55.5	4.75	5,400
Fair View Home, well	3, 12, 9													5,400
Twp. high service.	3, 12, 9	22	20	85	59	018	106	001	0.16	2.13	38.0	37.0	6.80	6,200
Dunbach's Ferry, raw water.	4, 23, 9													1,000
Filtration area applied.	4, 23, 9													600
Twp. high service.	4, 23, 9	30	30											350
Twp. high service.	5, 14, 9	15	15											380
Twp. high service.	5, 14, 9	12	50	109	81	012	198	001	0.16	2.00	57.8	53.0	4.40	450
Twp. high service.	5, 24, 9	12	12											210
Twp. high service.	5, 24, 9	14	20											5,000
Dunbach's Ferry, raw water.	5, 25, 9													5,000

RESULTS IN PARTS PER MILLION — (Concluded).

CITY, TOWN OR VILLAGE	Source	Date	Color	Turbidity	Residue on evapora- tion	Mineral residue	Nitrogen as —				Chlorine	Hardness, Total	Alkalinity	Oxygen consumed	Bacteria per c.c.	B. Col. Type (+ = Pathogen) (— = Absent)			
							Free ammonia	Albuminoid ammonia	Nitrates	Nitrates						10 c.c.	1 c.c.	1-10 c.c.	1-100 c.c.
Watervliet...	Tap, 507 Sixteenth street.	10/ 6/9	25	19	161	114	.026	.116	.002	.020	6.25	111.4	96.0	6.40	275	+	+	—	—
Watkins...	Tap, public supply.	1/16/9	1	Clear	234	201	.006	.110	.003	.040	54.00	87.1	86.5	0.90	120	+	+	+	—
Watkins...	Tap, public supply.	11/10/9	4	Clear	237	166	.008	.074	Trace	.006	56.00	128.6	87.1	0.80	65	+	+	+	—
Waverly...	Public supply from Sayre reservoir.	1/15/9	3	3	85	63	.020	.116	.004	.080	3.00	52.9	27.5	1.66	47,000	+	+	+	—
Waverly...	Tap, public supply.	2/26/9													14,000	+	+	+	—
Waverly...	Tap, public supply.	4/27/9													130	+	+	+	—
Wayland...	Tap, public supply.	6/ 8/9	Trace	2	167	126	.002	.054	.003	1.60	3.00	105.8	93.5	0.70	375	+	+	+	—
Weedsport...	Tap, public supply.	3/ 2/9	Trace	Clear	602	592	.062	.022	.001	1.40	2.25	353.5	206.5	0.40	1,400	+	+	+	—
Wellsville...	Tap, public supply.	1/20/9	Trace	6	159	130	.052	.064	.004	0.30	7.00	108.6	104.0	0.70	7	—	—	—	—
Wellsville...	Tap, public supply.	8/16/9	8	10	73	50	.042	.152	.002	0.10	5.75	45.7	39.0	3.25	280	+	+	+	—
Wellsville...	River water.	8/18/9													75	+	+	+	—
Wellsville...	Pump station, public supply.	8/18/9													1,250	+	+	+	—
Wellsville...	Tap (Albert Frey), public supply.	8/18/9													80	+	+	+	—
Wellsville...	City water from wells, public supply.	8/18/9													300,000	+	+	+	—
Wellsville...	Tap, 216 Madison st., public supply.	8/18/9													70	+	+	+	—
Wellsville...	Tap, 216 Madison st., public supply.	8/18/9													300	+	+	+	—
Wellsville...	Tap, High school.	10/ 8/9													300	+	+	+	—
Wellsville...	Tap, 340 Scott avenue.	10/ 8/9													300	+	+	+	—
Wellsville...	Pleasant lake.	8/27/9	2	3	106	55	.004	.134	.001	0.02	0.75	55.0	51.0	3.90	600	+	+	+	—
West Carthage...	Otis spring.	8/27/9													300	+	+	+	—
Westfield...	Tap, public supply.	1/22/9	2	40	140	105	.024	.228	.002	0.80	1.50	55.7	26.0	3.20	15,500	+	+	+	—
Westport...	Tap, public supply.	3/26/9	Trace	Clear	77	63	.024	.058	.001	0.10	0.37	47.1	47.0	0.55	30	+	+	+	—
White Plains...	Tap, public supply.	1/ 8/9	4	2	118	89	.032	.110	.006	0.50	4.00	60.0	51.5	2.50	300	+	+	+	—
White Plains...	Tap, public supply.	2/23/9	5	10	101	68	.038	.112	.004	0.50	3.75	61.4	47.0	1.85	250	+	+	+	—
White Plains...	Tap, public supply.	4/26/9	Trace	10	122	75	.012	.108	.003	0.50	4.00	68.6	52.0	1.85	450	+	+	+	—
White Plains...	Daily brook, near wells.	6/ 3/9	5	5	61	42	.012	.106	.007	0.60	4.12	31.1	20.0	3.70	—	+	+	+	—
White Plains...	Well No. 1, public supply.	6/ 3/9	5	—	28	118	.114	.003	0.04	3.25	28.0	17.5	2.90	2.75	—	+	+	+	—
White Plains...	Well No. 4, public supply.	6/ 3/9	8	—	146	102	.002	.054	.001	0.50	4.50	89.3	78.5	2.75	—	+	+	+	—
White Plains...	Reservoir No. 1, public supply.	6/ 3/9	2	—	28	20	.056	.054	Trace	0.04	3.00	18.2	4.5	3.40	—	+	+	+	—
White Plains...	Reservoir No. 2, public supply.	6/ 3/9	3	—	49	45	.104	.108	.002	0.04	3.25	22.8	11.0	—	—	+	+	+	—
White Plains...	Well No. 2, public supply.	6/25/9													14,800	+	+	+	—
White Plains...	Well No. 1, public supply.	6/25/9													6,200	+	+	+	—
White Plains...	Well No. 2, public supply.	6/25/9													44,000	+	+	+	—
White Plains...	Reservoir No. 1, public supply.	6/25/9													13,500	+	+	+	—
White Plains...	Reservoir No. 2, public supply.	7/10/9													650	+	+	+	—

White Plains.....	7/19/9	37	3	129	90	.106	.118	.008	0.50	3.50	73.6	4.80	600	.....
White Plains.....	7/19/9	7	2	212	184	.128	.060	.006	0.20	3.25	140.0	1.90	6,500	.....
White Plains.....	7/19/9	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	400	.....
White Plains.....	7/19/9	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	20,500	.....
White Plains.....	7/19/9	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	200,000	.....
White Plains.....	7/19/9	7	1	33	22	.004	.060	Trace	0.04	3.12	19.5	1.95	450	.....
White Plains.....	7/19/9	6	9	58	35	.008	.222	Trace	0.04	3.25	18.9	4.05	600	.....
White Plains.....	7/19/9	7	175	91	71	.024	.354	.001	0.24	1.50	48.6	6.80	325	.....
White Plains.....	7/19/9	Trace	.....	205	165	.020	.060	.001	0.20	3.75	142.8	0.70	130	.....
White Plains.....	7/19/9	28	1	45	27	.028	.114	Trace	0.20	0.25	14.3	11.5	15	.....
White Plains.....	7/19/9	5	1	197	164	.002	.064	.003	0.00	4.12	145.8	1.75	1,900	.....
White Plains.....	7/19/9	52	1	46	25	.008	.064	Trace	0.16	0.25	20.8	0.20	7,900	.....
White Plains.....	7/19/9	Trace	Clear	135	111	.004	.006	.001	1.00	1.37	101.5	0.20	180,000	.....
White Plains.....	7/19/9	Trace	.....	552	452	.002	.030	.001	0.20	11.20	450.0	0.85	13,000	.....
White Plains.....	7/19/9	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	85	.....
White Plains.....	7/19/9	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4,700	.....
White Plains.....	7/19/9	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	19	.....
White Plains.....	7/19/9	Trace	.....	708	612	.002	.036	.001	0.14	17.00	478.5	1.20	2,300	.....
White Plains.....	7/19/9	Trace	.....	715	620	.002	.036	.001	0.10	16.50	478.5	0.90	475	.....
White Plains.....	7/19/9	Trace	.....	705	615	.006	.030	.001	0.10	16.37	471.5	1.25	1,400	.....
White Plains.....	7/19/9	1	2	32	19	.026	.130	.001	0.08	0.50	9.5	3.0	120	.....
White Plains.....	7/19/9	23	20	132	83	.078	.120	.007	0.80	5.37	89.0	1.55	16,000	.....
White Plains.....	7/19/9	8	2	81	54	.106	.172	.004	0.14	3.75	40.3	2.95	15,500	.....
White Plains.....	7/19/9	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	43,500	.....
White Plains.....	7/19/9	4	5	78	54	.044	.138	.003	0.24	3.50	47.1	28.5	1,400	.....
White Plains.....	7/19/9	Trace	2	331	245	.024	.086	.015	3.60	6.25	218.0	211.5	31	.....
White Plains.....	7/19/9	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	450	.....

In connection with the special investigations in co-operation with the Divisions of Communicable Diseases and Engineering, the Laboratory has made the examination of samples of water from Camden, Clayton, Cooperstown, Richmondville and Geneva for investigations of the existence of typhoid fever, and has also received and examined samples of milk, as a possible contributing agent of this disease, from Warsaw.

In co-operation with the Engineering Division, in its special investigation of a nuisance at Staten Island, elsewhere reported upon, the analysis of air, soil and samples of the vegetation and determination of specific poison in such samples; was undertaken by the Laboratory, the results of which will be found in the full report of that investigation.

The work of Group C — diagnostic examinations for the detection of infectious disease and control of quarantine — has been continued as in previous years as a matter of contract service. This diagnostic service fails to show evidence of expansion in relation to the general expansion of other work of the Laboratory and is certainly not accomplishing all that could be expected of this branch of the service. The work done in this connection is submitted in the following tabular form and its comparison with the work of previous years shows its lack of growth.

It has, therefore, been accomplished with considerable satisfaction in the hopes of betterment of this service; that after January 1, 1910, this diagnostic work shall be transferred and become a part of the regular work under the immediate control of the State Hygienic Laboratory and its direction.

Laboratory Diagnostic Work for 1909

MONTH	CULTURES FOR DIPHTHERIA DIAGNOSIS							
	Positive		Negative		No Growth		Total	
	1908	1909	1908	1909	1908	1909	1908	1909
January.....	50	120	61	150	13	33	124	303
February.....	87	83	82	54	9	6	178	153
March.....	84	30	68	40	6	4	158	74
April.....	60	59	44	35	6	16	110	110
May.....	58	32	23	52	6	25	87	129
June.....	32	54	35	69	4	20	71	143
July.....	31	49	45	55	3	17	79	121
August.....	32	26	27	81	7	14	66	121
September.....	61	34	53	68	9	20	123	122
October.....	52	24	45	68	12	8	109	100
November.....	85	101	129	169	13	11	227	281
December.....	109	143	123	173	33	27	265	314
Total.....	741	755	735	1,024	121	201	1,597	1,971

Laboratory Diagnostic Work for 1909 — (Continued)

MONTH	SPUTUM EXAMINATIONS							
	Positive		Negative		Unsatisfac- tory		Total	
	1908	1909	1908	1909	1908	1909	1908	1909
January.....	14	51	40	92	0	0	54	143
February.....	23	44	40	101	0	0	63	145
March.....	29	58	40	85	2	0	71	138
April.....	28	44	47	69	0	2	75	115
May.....	33	45	42	120	1	0	76	165
June.....	35	39	45	115	0	2	80	156
July.....	31	33	37	135	0	0	68	168
August.....	28	60	42	113	0	0	70	173
September.....	31	32	61	110	1	0	93	142
October.....	55	39	27	115	0	0	82	154
November.....	7	36	9	89	2	1	18	126
December.....	15	45	68	101	9	0	92	146
Total.....	339	526	498	1,245	15	5	842	1,766

Laboratory Diagnostic Work for 1909 — (Concluded)

MONTH	WIDAL TEST FOR TYPHOID FEVER							
	Positive		Negative		Suggestive		Total	
	1908	1909	1908	1909	1908	1909	1908	1909
January.....	4	12	8	15	6	7	18	34
February.....	7	25	14	24	3	28	24	77
March.....	5	18	13	18	6	27	24	63
April.....	0	10	6	9	1	11	7	30
May.....	8	0	11	15	2	2	21	17
June.....	6	2	16	12	3	0	25	14
July.....	11	1	15	10	9	0	35	11
August.....	29	1	33	8	22	0	84	9
September.....	19	3	61	18	8	1	88	22
October.....	16	0	41	18	6	0	63	18
November.....	26	5	48	16	2	3	76	24
December.....	16	15	16	16	2	8	34	39
Total.....	147	92	282	179	70	87	499	358

The special investigations assigned to the Laboratory Division during the year have been limited for various reasons. In March, 1909, a small localized epidemic of typhoid fever at Coxsackie, N. Y., was investigated and reported upon to you by Inspector No. 12 of this division. Copy of that report is appended, together with your letter of transmittal of a copy of the report to the local health officer.

ALBANY, N. Y., *March 31, 1909.*

HON. EUGENE H. PORTER, M. D., *State Commissioner of Health, Albany, N. Y.:*

SIR:—I am respectfully reporting the results of my investigation, made March 26, 1909, of the probable cause of typhoid fever cases that have occurred in the family of Sebastian Strayley who keeps a boarding-house for ice handlers. The house is located about one mile below the village of Coxsackie, on the west bank of the Hudson river, and where thirty-five to fifty men stayed during the ice harvesting season, at which time the sickness was in the household.

The histories in the cases in the Strayley family follow:

On March 13, 1909, Dr. A. W. Van Slyke, health officer of the town of Coxsackie, was directed to investigate and look after the

disinfection necessary for the proper disposal of discharges from the typhoid patients in the household.

On visiting the place, he learned that Louis Strayley, age 7 years, had been sick since February 3d and had been treated by a physician who had not reported the case. At that time, the boy was convalescent.

About March 5th, Mary Strayley, a sister to the father of the family, came down with the fever; and about March 6th, Michael Fox, a nephew, was taken ill. He died March 22d.

Sebastian Strayley, the father, is now at the Kingston hospital with the disease; and a brother living across the river, who worked at the ice houses near the Strayley home but did not eat at their home, died but a few days ago of the same disease. I was not able to establish a definite connection between his case and those of the brother's household, as I was informed that he did not come in contact with the sick in the household nor eat food prepared at that home.

Two sources of water supply were available at the Sebastian Strayley home: The river water and water from a spring coming out of the embankment about 30 feet from the river and about 10 feet above the water level.

The spring is located about midway between two ice houses, about one-fourth of a mile apart, and at the foot of a terrace rising rather abruptly from the river towards the west. The formation is Hudson river shale, outcropping at the surface in places, and at others covered with a comparatively thin layer of gravel.

There are but two houses on this terrace, and they are one-fourth of a mile distant at an elevation of about 200 feet above the spring.

In October, 1908, a Mr. Jenny and his son, living in one of these houses, had typhoid fever. The outhouse was at that time full to overflowing, and the contents were strewn on the ground and could have been scattered by the feet of those walking about. This house is situated on a plateau and the slopes are not such that one would expect a direct surface wash down the slope to the spring. The conditions at this place have since been improved.

Dr. Van Slyke believed it possible that these conditions might have infected the spring at the foot of the terrace, but my investi

gation would lead me to believe that another cause was more probable.

In 1906, Dr. Van Slyke attended typhoid cases, those of three ice handlers living in entirely different neighborhoods outside of the village, but who had drank water from this same spring. This might have been a coincidence but was justification for his inference that this spring was the probable cause of the present cases when he learned that the family now afflicted had drank water from this spring.

The home occupied by the Strayley family is located within 25 feet of the water's edge and about 12 feet above the water level in the river. The privy is a superstructure joined to the north or upstream side of the house. There is no vault, but the discharges fall into a shute leading to the river. The kitchen waste is led into the same shute. Inside the house, there are water barrels, and these are filled by a hand pump which pumps water from the river. The intake end of the pipe supplying the pump is about 35 feet down stream from the shute carrying the family wastes. There is nothing left for the imagination. The circulation is complete.

After close questioning, the mother stated that the water pumped from the river had been drunk by the whole family prior to the onset of the illness of the first boy, February 3d. The doctor later advised them to drink the water from the spring, which they did, but they are now again drinking the river water.

The first case quite probably came from drinking the river water and the later cases could have been from the first case, either by secondary infection within the household or if any of the discharges from the first case reached the river by way of the privy and shute, and from there down stream to the suction pipe of the pump taking water from the river, a more direct mode of transmission could hardly be conceived.

Because the family drank some water from the spring previously described, they attributed the disease to this cause; but after learning all the facts, I believe that the river water or secondary infection in the household is the more probable source of the infection. The month or more elapsing between the time of onset of the first case and of the succeeding cases strengthens the idea

that the later cases were caused by secondary infection, either within the household or by the river water, the family's own privy and pump suction in the river acting as connecting links in the circulation.

Dr. Van Slyke gave the family instructions as to the proper methods of disinfection, and gave them over a pound of bichloride of mercury to use for this purpose but the disease had been already prevailing in the family for six weeks before the fact was brought to his notice, and we have no definite knowledge of the precautions taken previous to that time.

The geologic formation (shale rock) and the contour of the surface make it impossible to prevent the pollution of the river, either directly as at present with the shute arrangement or indirectly by seepage through crevices in the rock if an ordinary privy vault is used. The only safe way would be the use of a water tight pan closet and to empty the contents at intervals and at a place entirely remote from the suction pipe. Replacing the present arrangement by a privy of the ordinary type at a point down stream from the intake would be of little advantage, as the tide might even then carry infected water towards the intake point. Under the present conditions, the water pumped from the river at this place is dangerous and should not be used without boiling.

An analysis of the spring water showed a high count, but bacilli of the B. Coli type were present in only one inoculation.

The results do not indicate marked fecal pollution, and there is little probability of this water being infected.

Respectfully yours,

LEONARD M. WACHTER,

Sanitary Chemist

ALBANY, N. Y., April 6, 1909.

Dr. A. W. VAN SLYKE, *Town Health Officer, Corsackie, N. Y.:*

DEAR DOCTOR: — I am sending to you the report from the State Hygienic Laboratory, of the investigation of the outbreak of typhoid fever in your jurisdiction.

I understand that you have taken active measures for the prevention of the spread of the disease in so far as the matter of dis-

infection and care in the management of the cases is concerned. If there is any further trouble from these cases, I shall be very glad to be informed of it.

Very respectfully,

EUGENE H. PORTER,

Commissioner of Health

Under date of September 27, 1909, a letter of Mr. F. B. Durant, president of the board of directors of the Fairview Home, a philanthropic institution located in the town of Colonie, closely adjacent to the town of Watervliet, was received by this Department.

As a consequence and in compliance with your order, the situation described in that letter was investigated and reported upon to you by inspector No. 7, of this Laboratory.

A copy of that report and of a supplementary report follows:

ALBANY, N. Y., *October 21, 1909.*

HON. EUGENE H. PORTER, M.D., *State Commissioner of Health,*
Albany, N. Y.:

SIR: — Regarding an investigation of a prolonged condition of diphtheria infection at the Fairview Home, Watervliet, N. Y.

Subject to the complaint of F. B. Durant, president of the board of directors of the Fairview Home, made to you on September 27th.

Subject to your order to the State Hygienic Laboratory of the same day to investigate that complaint, your inspector No. 7 made an appointment with the president and George Kimberly of the board of directors of Fairview Home to inspect that institution, and made such inspection on the 28th of September.

On arrival at the Home, the above mentioned gentlemen and your inspector were met by the superintendent and the two attending physicians, Dr. F. P. Van Denbergh and Dr. L. B. Rulison.

The medical registry of this institution was first inspected, and a copy, in so far as it concerns the contagion of diphtheria, is herewith adjoined as appendix A.

The entire group of buildings, including every room, cellars, kitchens, bath rooms, hospital building and other out buildings were thoroughly inspected in company with the gentlemen aforementioned.

Every point in plumbing, drainage or other possible insanitary condition of any of these buildings was looked for. The milk supply, the provisioning methods of the institution, and the entire care and routine daily methods of school room, kitchen, dining-room, laundry and dormitory were thoroughly investigated.

The methods of inspection in case of illness, the degree and promptitude of the care of the attending physicians were inquired into; and the control and the methods of quarantine in case of contagious infection also investigated.

It was found that the general sanitary condition of all of the buildings was good, and contagion by way of the milk supply or the general provisioning of the inmates was scarcely probable. The general care and method for detecting a case of contagious disease exercised in this institution were excellent, and the investigation was thus narrowed to a careful study and observation of the origin and progress of the present existing diphtheria contagion in that institution.

The cases and dates of their occurrence were plotted, and the rise, fall and persistence of diphtheria infection were thus graphically represented by a line, of which an illustration is adjoined as appendix B.

The observation of this line indicates very clearly by the periods of time elapsing between the succeeding maxima of diphtheria that the continued existence of this infection in the institution must be, by reason of transmission, by contagion between the inmates, and the nature of this graphic curve indicates that the contagious individual is most likely to be found in one released without a sufficient quarantine from the hospital of this institution; and, consequently, the efforts of this investigation were directed to a most minute inquiry and observation of the conditions at the hospital, the rules of commitment of diphtheria cases to that institution, the release and severity of the quarantine maintained in such cases.

Reference to appendix A will show you the total number of

cases that have occurred in that institution from the date of the first case, June 12th, to the present time. You will note that the larger number of cases in the institution was in the last half of the month of June; that subsequent to this outbreak there was a short period in which no further cases of diphtheria developed. There then appeared a number of cases, and the period of time that had elapsed from the first outbreak to this reappearance is found to correspond very closely with the time necessary for individuals that were released, after very short quarantine, at the time of the first outbreak to have infected the individuals of the second outbreak, allowing a proper time for the incubation of the disease in the individuals of this second series.

The same remarks are pertinent in regard to the subsequent appearance of diphtheria in this institution up to the present time.

The routine method of the institution in case of contagious disease is found to have been as follows:

Whenever a nurse, guardian or teacher notices an ill-condition of any of the inmates, this condition is reported to the superintendent of the institution, who himself, apparently with great painstaking, investigates the case. In this connection it is apparent that the superintendent has by experience and familiarity considerable ability to detect the usual contagious diseases of children, and often is able, before the arrival of the attending physician, to put into effect measures of segregation of this individual which he suspects, and is subsequently confirmed of being a case of contagion.

The suspected individual is promptly examined by one of the attending physicians, and subject to this examination, if ill with contagious disease, immediately committed to the "hospital" and subjected to quite efficient segregation and protective measures of quarantine.

The hospital of this institution is in a building entirely separate from the building used in the daily life of the institution, but is connected to the general buildings by a long covered and inclosed passage way.

It was found that very vigorous measures of preventing any communication through this passage way with the hospital had been instituted, and that all articles — dishes, slops and material

of any nature whatever coming from the hospital — were taken from the hospital only after their thorough disinfection by a competent attendant in the hospital building itself, to which attendant all supplies were delivered at the door of the hospital through this passage way.

The entire investigation of these regulations and methods of procedure did not reveal any subject for criticism or point to any source of contagion in this direction.

It was observed, however, during the visit of your inspector that a convalescent case of diphtheria, allowed to wander in the yard about the hospital but entirely shut off from any access to the buildings or grounds where the other inmates were, had herself carried the used dishes of her lunch to a little back door joining the main building, and these dishes evidently reached the general kitchen of the establishment without any proper disinfection. The matter was immediately noted and corrected, and it was stated that it was purely accidental and could not have occurred previously, and was, in fact, a violation of the regulations established by the institution itself. It was not deemed a sufficiently flagrant or continued violation of a good quarantine to be a probable cause of the continued contagion in this institution; and careful inquiry was then instituted as to the methods of the attending physicians in instituting and releasing a quarantine.

It was found that up to the time of your inspection no bacteriological examination of the throats of any of the inmates of this institution had been made.

It was found that a commitment to hospital or subjection to quarantine had been made by merely clinical symptoms of the individuals affected, or on general indications and judgment of the attending physicians.

It was found that in no case had a release of a patient recovering from diphtheria or the release of an individual from quarantine ever been conditioned upon the bacteriological examination of the throat of such individual, and that there was no positive knowledge or indication in the hands of either of these physicians that would prompt them to state whether such released individual did or did not carry diphtheria germs in their throats when permitted to join the usual inmates of the institution.

It was found that in one or more cases an individual committed to hospital as diphtheritic patient was released from hospital and from quarantine, and permitted to join the usual inmates of the institution in a period of a very few days on the ground that they were not showing any symptoms of illness. These facts in the judgment of your inspector and admitted by the superintendent, were sufficient to point with the strongest suspicion to the improper and insufficient quarantining here in vogue as the cause of the continued contagion in the institution.

The long period of four months during which this infection had continued; the possibility of many adults carrying for long periods virulent germs of diphtheria in their throats while still apparently healthy; the large percentage of the inmates of this institution that had manifested clinical symptoms of diphtheria, and the fact that the release of such patients had never been controlled bacteriologically, made it very probable that many of the inmates of this institution might still carry the germs of diphtheria in their throats and be a constant menace and source of contagion to the other inmates and able, in this way, to prolong and make a periodic contagion of diphtheria here unless radical measures were taken.

As a test of the correctness of the opinion of your inspector that the continued contagion might be due to the persistence of diphtheria germs in individuals improperly released from quarantine, there were called before him the three most recently released individuals, and he personally examined their throats and took therefrom bacteriological cultures. One of these three cultures examined showed the bacteria of diphtheria actively existing in the throat from this released patient who was coming in daily contact with many of the inmates of the institution. A culture taken the following day from an inmate of the hospital that it was proposed to release on that day also showed active and living bacteria in the throat of that individual.

This confirmation of the opinion of your inspector was sufficient to decide him, and also the attending physicians and superintendent, to proceed to the complete bacteriological examination and control of all of the throats of every inmate, official or attendant of the Fairview Home.

This examination was made and is now completed. The results of this entire work are subjoined and the notes of the results will be found in the form of appendix A.

Wherever a number of cases of persistence of the diphtheria bacilli in the throats of the otherwise well inmates were found, in every case these individuals were committed to quarantine or hospital, but not before several cases of diphtheria occurred in this institution.

It will be noted that these last cases of contagion followed very closely the visit of your inspector, plainly showing that the contagion occurred before his visit. And his inquiry in that connection would indicate that these cases resulted from a manifest close association of the individuals with the first person whose throat was examined by your inspector and found to be a cause of contagion. Since this time there have been no further cases of diphtheria in the institution.

Immediately that it was found that throats of inmates allowed free circulation in the institution contained diphtheria bacilli, it was recommended by your inspector, accepted and put into thorough execution, to spray the nose, throat and naso-pharynx in the most thorough manner with cultures of the pure lactic acid bacillus (Metchinkof), with a view of thus exterminating any diphtheria bacilli existing there by the known antagonism of growth of this latter bacillus. In order to assist in these radical measures, as far as possible, the physicians and management of the Fairview Home, the State Hygienic Laboratory itself undertook the examination of all of the forementioned diphtheria throat cultures, and made and furnished this institution with the cultures of the lactic acid bacillus above mentioned. And immediately following the determination of the diphtheria contagion in the throat of the individual too prematurely discharged from quarantine, it was directed by your inspector that this individual be recommitted; and each subsequent individual found to be a source of contagion was promptly recommitted, every individual showing an outbreak of diphtheria or showing the diphtheria bacilli in its throat was immediately subjected to severe measures of quarantine or hospital care, the entire communication of the hospital building with the outside world was most carefully pre-

vented, and very thorough and efficient measures for most rigorous protection from any further contagion were instituted by the direction of the superintendent of this home. The attending physicians themselves willingly undertook the examination and collection of cultures from the throats of every inmate, and repeated this work completely once, and in the cases specified by your inspector a third time, in order that knowledge of the condition of the throats might be obtained.

It was also ordered by your inspector that there be no release from hospital or quarantine of any individual until a report of the culture made from its throat, repeated and controlled if necessary, had been made by the State Hygienic Laboratory to the institution, showing the complete absence of any of these infecting germs from the throat of the individual proposed for release; and the institution in its administrative and medical management has apparently most heartily co-operated with your inspector to enforce all the measures and orders instituted in this respect.

Immediately following the visit of your inspector, showing the existence of a diphtheria contagion in Fairview Home, the circulars of this Department relative to diphtheria and to disinfection were sent to the superintendent, the attending physicians, president and members of the board of directors that were present at the time of the investigation of the institution.

The health officer of the town of Colonie, in which the Fairview Home is located, was communicated with and requested for information relative to the condition of this institution and of neighboring institutions that were also reported to be infected with diphtheria. A copy of this communication to the health officer is herewith joined as appendix C.

In answer to this communication to the health officer, he replied, by telephone, that he would investigate the matter. After awaiting such investigation for a reasonable period, the health officer was requested in writing by this Department to furnish his report for the week ending October 16th. A copy of this request is joined as appendix D.

The reply of the health officer thereto is joined as appendix E.

The superintendent of the Fairview Home notified your in-

spector verbally October 19th that there had been no recent appearance of diphtheria in the institution; and subject to the reports on the cultures from the throats of convalescents and quarantined members of that institution, they will be released within a few days now, and the matter of this investigation will be considered terminated, subject to your further order and an unexpected continuance of this contagion in the home.

Respectfully submitted,

WILLIAM S. MAGILL, M.D.,
Director, Hygienic Laboratory

SUPPLEMENTARY REPORT

ALBANY, N. Y. *October 21, 1909.*

HON. EUGENE H. PORTER, M.D., *State Commissioner of Health,*
Albany, N. Y.:

SIR:— I herewith transmit a report of your inspector No.7, relative to your order of September 27th last to investigate a reported continued infection of diphtheria at the Fairview Home, Watervliet, N. Y., and a supplementary report in this connection, which I take the liberty to adjoin, without your order therefor.

Your inspector examined the throats of a number of the inmates of Fairview Home, relative to a suspicion of their being carriers of diphtheria bacilli; and in the course of this examination noted a marked percentage of these inmates with very large, abnormal, adhesive or otherwise deleterious tonsils; and a number of the inmates suffering markedly from adenoid growth.

It is manifestly a difficult matter to properly cleanse and sterilize throats of such nature; and quite aside from the injury done to such individuals in allowing the continuance of such condition, it is a necessary step in the suppression of a diphtheria infection to proceed to the proper treatment of those infected throats.

It was recommended by your inspector to the authorities of the Fairview Home that steps be taken to care for these affections as promptly as possible on the ground that it would facilitate, if it were not even a necessary step for the disinfection of these throats as a possible menace of diphtheria contagion.

This is respectfully reported to the Commissioner as a matter at his discretion as to what steps shall be taken to effect treatment of these individuals.

Respectfully submitted,

WILLIAM S. MAGILL, M.D.,

Director Hygienic Laboratory

Complying with your order of November 26th to investigate and report upon conditions of typhoid fever epidemic at Clayton, N. Y., inspector No. 7 of this Laboratory visited Clayton and thoroughly investigated that situation. The visit of this inspector followed the investigation of this matter by the Engineering Division, and further action in the same matter was taken by you and is reported upon elsewhere.

A copy of the report of this inspector follows:

ALBANY, N. Y., *December 24, 1909.*

HON. EUGENE H. PORTER, M.D., *State Commissioner of Health,*
Albany, N. Y.:

SIR:—In conformance with your order of November 26th, transmitted to the undersigned inspector No. 7 of the State Department of Health, with the files of correspondence of the Department relative to the typhoid condition of Clayton, New York, your inspector proceeded to Clayton on December 1st to make an investigation of that situation.

The files of the Department and the reports of previous investigations relative to sewer and water supply, show that the sanitary condition of Clayton has been unsatisfactory to the Department for a number of years.

Since 1899 Clayton has had water works and sewer system, a plan of which is submitted and marked "Plate 5," and appended thereto is a plate of the United States Geological Survey, showing the situation of Clayton in relation to Cape Vincent, the railroad tracks of the New York Central & Hudson River railroad and showing the islands in the proximity of Clayton, the large bay and a river "French creek," which empties into the bay just above stream from the town of Clayton. This map is marked "A."

Referring to the plan of the water works and sewer it is seen,

and subsequent information confirms the appearance that the sewer pipes were put in in the same ditch as the water pipe in Clayton and that they discharged by the same ditch into the St. Lawrence river. The intake pipe of the water system running out 670 feet into the river where the water is said to be 80 feet deep, whereas the discharge pipe of the sewer system bends down stream and discharges relatively close to the shore line.

In addition to the sewers shown on this map, reported to have been approved by this Department, there has been more recently constructed an independent but small sewer in the southwesterly portion of Clayton, emptying into the portion of the bay above stream from Clayton close to a point at which "French Creek" empties into that bay of the St. Lawrence river.

The outlet of this sewer is close to the bridge crossing "French Creek," that is shown in the map "Appendix A." This sewer has been constructed without any reference to, knowledge of, or permission from the State Department of Health. The attention of the local board of health has been called to this illegality in preceding years, but the matter has received no attention and no correction.

It is obvious from the data in your files that there has been an undue amount and constant reappearance of typhoid fever in this town for at least two years, exciting the serious attention of your Department and effort to induce steps for the improvement of this situation on the part of the local board of health of Clayton.

During the summer the sanitary condition in that town has been so unsatisfactory that you have received complaint from physicians in neighboring settlements, from citizens of this State that are summer residents in that locality and from at least two clergymen living in Clayton.

Very specific complaints and serious charges have been made that there was this summer an extensive and serious outbreak of typhoid fever in Clayton, appearing in June and extending through October, during which time there were from fifty to one hundred cases of this illness in that town, the total population of which does not exceed two thousand, and that from this disease seven to twelve cases resulted fatally.

The charge is made by responsible individuals that the physi-

cians were not declaring these cases as typhoid fever, but were, in fact, hiding the situation, and there has been a decided intimation to your Department that there was collusion to this effect on the part of the inhabitants of Clayton, in order to conceal their really insanitary condition.

On August 3d the health officer of that town communicated to the Department his first indication that there were cases of possible typhoid fever there and his first intimation of making any attempt to secure the services of this Department to determine the diagnosis. On September 23d this health officer forwarded a sample of the water supply of Clayton for examination by the State Hygienic Laboratory, but your Department had already sent a member of the engineering staff to investigate the sanitary conditions of Clayton on the ground.

Reference is here made to the report of your engineer relative to that investigation, marked "Appendix B" and to the copies of the results of four analyses of the samples of water taken by your engineer at that time, marked "Appendix C" and reported to you on October 5th, and the report and recommendations of the chief engineer in relation to this matter submitted to you on October 8th and marked "Appendix D."

The substance of the steps and recommendations suggested in these reports was communicated by you and transmitted by you on October 12th to both the president of the village and the president of the board of health of Clayton.

Previous to this formal action of the health commissioner and immediately following the inspection of Clayton, made by the engineering staff of this Department, you notified the health officer of Clayton, New York, under date of September 27th, to "continue the warning to village water supply consumers that all water should be boiled." You also upon the same date urged the health officer to use the Widal test and determine accurate diagnosis of every fever or abdominal disturbance case occurring under his jurisdiction and you furthermore wrote to every physician practicing in that town, under date of September 27th, urging the use of the Widal test and informing them that the health officer was supplied with the outfits furnished by this Department.

Under date of October 4th, complaint was made to you, specifi-

cally stating, "no caution as to the use of the water has been issued," in consequence of which you telegraphed the health officer on October 7th, as follows: "Complaint received that water consumers in Clayton have not been fully advised as to boiling water. Kindly inform me as to facts and follow instructions in letter of September 27th, publishing notice to public and distributing hand bills, if none have been posted." Copy of this telegram submitted with the answer of the health officer as "Appendix E."

Under date of October 7th, the health officer of the town of Clayton, answering your telegram of the same date, distinctly states, "notice has been given in local papers."

Under date of October 9th, a clergyman resident of Clayton, referring to previous correspondence, states, "the local board of health are inactive in this matter and no information has been given to the public beyond that contained in the local papers, forwarded under separate cover. * * * Four new cases have arisen within the past week to my own knowledge and one death occurred." The copies of the local papers alluded to in the preceding sentence, contained absolutely no warning to the public relative to the water supply.

Under date of October 13th a resident of Clayton wrote you, "I trust that the State Board will be prepared to compel action. The local board of health failed to carry out the instructions of the State Board that residents should be instructed to boil all drinking water."

Subsequent letters from residents of Clayton and that neighborhood, made it manifest that the local health authorities did not have the confidence of some of the citizens of their township and specific charges were made that these local health authorities were not acting upon the instructions of your Department, although you had the assurance of that health officer, in answer to a specific charge, that he had published your warning.

To determine the truth of all of these various matters of complaint and the relative responsibility and efficiency of the parties engaged, was the object of the examination made by your inspector No. 7.

It was found that in spite of the offer and insistence upon the

utilization of the services of the health department for diagnosis of typhoid fever, in only one case had such services been utilized throughout the month later. Your representative called upon the health officer of Clayton, Dr. H. J. Frame, and three other practicing physicians in that town. There was no evidence of notification of the public of any danger of their water supply, to be found by your inspector previous to the posting of two large notices within, but on each side of the entrance door of the post-office. These notices were sufficiently large and the warning which they promulgated was sufficiently explicit. They bore date of October 14, 1909.

In the middle of the most prominent place of Clayton a large public drinking fountain, with spouting water from the village supply, was in full operation, with no indication whatever in the neighborhood that the use of such water might be dangerous, and the inspector was informed that absolutely no effort to indicate a possible danger, or to safeguard the public from the use of this water had ever been taken.

The attention of the health officer was called to his letter to you of October 7th, stating that public warning had been made; to the fact that the specific charge was made by a resident that such public warning had not been made until after that date; and furthermore, that the visiting inspector could find no evidence of any such warning made public in any way previous to the date of October 14th, and the health officer was invited to furnish that day evidence to establish the truth of his statements on October 7th, that public warning had been given. Up to this date no such evidence of publication at that time has been submitted to your inspector.

The water and sewage systems of Clayton were discussed at this visit and the health officer was asked specifically whether he knew of any other infraction of the disposal of sewage by the residents of Clayton than that sewage system planned by the Department map, which is here appended, (Plate No. 5) with the exception of the known illegal emptying of sewage near the bridge over "French Creek," previously described in this report. The health officer stated that he knew of no other illicit sewage disposal.

Your inspector subsequently in the day was informed by at

least one clergyman and two physicians that two of the principal business blocks in Clayton had always discharged their sewage directly from the rear of their buildings into the St. Lawrence river, on the bank of which they stood; that this condition was perfectly well known to the members of the local board of health and to the health officer; that only within a few weeks previous — subsequent to the time of the first inspection of your Department, made by the Engineering Division and previous to the time of this actual visit of inspector No. 7 — had this illicit sewer outlet been stopped.

It may be also remarked that the discharge of sewage at this point, under conditions of current often existing in the St. Lawrence, would deposit sewage in exceedingly close proximity to the intake point of the water supply of the town.

In addition to the physicians, a prominent clergyman and other citizens of Clayton were interviewed by your inspector.

Not a single physician hesitated in the slightest in admitting that there had been more or less typhoid fever occurring in their practice since the month of June, but at the time of the visit of your inspector there were no new cases occurring and there remained only two cases of typhoid — then convalescent — that could be found.

Three of the four physicians declared that there was no malaria in Clayton, nor had there ever been. The remaining physician maintained that he had had cases of malaria and also described certain of his cases which were quite indicative of mephitic poisoning.

Every physician, however, agreed that the following could be accepted as a true statement of the sanitary condition of Clayton relative to typhoid infection, i. e., Clayton had for some years been using a water supply infected with fecal pollution; that this fecal pollution in rather permanent and somewhat large quantities had produced a somewhat inoculated typhoid condition in the majority of the inhabitants of the town.

When the quantity of fecal pollution in this water rose above the normal for preceding years, a mild typhoid condition affected a number of these people and this affection constituted the majority of the fifty to one hundred cases that had occurred this summer in Clayton. When, however, a person not using the water supply of

Clayton, or a visiting individual not thus inoculated by the constant use of a fecally polluted water did absorb such fluid into his system, that a far more virulent form of typhoid fever resulted and that thus the typhoid fever of Clayton, while perhaps not severe or particularly fatal among its own inhabitants, was severe and highly fatal when contracted by visitors to that town.

Not a physician disputed that there had been fifty to one hundred such cases during the summer. Not a one of these objected to their being diagnosed as typhoid fever of the nature and origin set forth in the preceding sentence.

Every physician assured your inspector in the earliest moments of his call that neither he nor his family had used the water supply of the town for months, nor would he think of doing so.

Every physician was asked if it was not apparently their duty to diagnose promptly and report every such case of typhoid fever and that in view of the admitted condition of the water supply, if it was not their duty to suspect every case of fever, or abdominal disturbance as of typhoid origin and thus report it, except as such case could be absolutely excluded from the possibility of a typhoid infection by reason of clinical symptoms of persistent absence of the Widal reaction and they were asked to explain why with these postulates they had not utilized the services of this Department to make a positive diagnosis of typhoid fever and fulfill their duty in thus diagnosing and reporting all cases of such infection.

Satisfactory explanations relative to these questions were not made by any of the physicians in the town.

The files of the Department show the broken down condition of the intake pipe of the water supply which practically admitted the outflowing sewage of the town directly into the water mains. These files show the discovery of this condition, subject to the recommendations of this Department and as a result of the examination of the water supply made by the State Hygienic Laboratory and the Engineering Division of your Department.

Inspector No. 7 verified the completion of the repairs of this defective intake pipe; that these repairs had then been completed for a sufficient time to permit of securing fair samples of the present water supply. These samples were analyzed by the State Hygienic Laboratory and the reports of the results of these analyses are herewith submitted as "Appendix F."

Although the sewer system of Clayton had been established for very many years, it was found that the sewers had never been flushed previous to the visit of the Department Engineer in September. It was found that the general establishment and enforcement of quarantine in cases of contagious diseases had for years been exceedingly lax, irregular or unjust.

A remarkable sentiment prevailed among the members of the medical profession in Clayton. Your inspector was unable to discover in any member of the profession there practicing any realization of his moral responsibility for failure to diagnose a typhoid infection, to report any such condition to this Department, or failure by such negligence to protect the health of the individuals in his community previous to this fall. It was found that three of the four practicing physicians in that community unitedly and individually refused any professional association with the fourth practitioner there. Serious charges concerning the attitude of that fourth member relative to the diagnosis, reporting and quarantining of infectious disease through him were made individually to your inspector by each of the three other physicians and will be communicated to you in a separate report if you desire.

The health officer was requested to inform this Department promptly of the appearance of any further case of typhoid fever in his district. No such notification has been received. In conclusion it appears that the charge made by a citizen of Clayton that the warning recommended by this Department had not been published in Clayton previous to October 14th, is correct. Evidence that the statement of the health officer, made on October 7th, that such publication had been made has not been found by your inspector, although every individual interviewed by him in Clayton was asked specifically for such evidence and the health officer himself was invited to submit it.

It appears that from fifty to one hundred cases of typhoid fever have occurred in that town in the period of June, 1909, to November, 1909, inclusive, and any number less than that and any cases of the actual number of cases of typhoid fever reported to this Department in that period from Clayton, represents the default of the practicing physicians there and of the health officer in that district, to comply with the conditions of the law in that respect.

It is evident that permanent buildings in the heart of Clayton

have illegally discharged their sewage directly into the river without connection of the sewage system and that this illegal action has gone on for years with the knowledge of members of the boards of health in that locality. It is evident that this discharge of sewage during this summer was known to the local health officer, who declared to your inspector that he knew of no other infraction of the sewage system plant approved by this Department, than that discharging into "French Creek," which is quite other than the matter here at issue.

Your attention is invited to the fact that the illegal discharging of sewage into "French Creek," which has for some years been called to the attention of the local board of health by you, has never elicited any action on their part. This is a distinct defiance of law and of authority on the part of the local board of health and it is to be noted that among the first cases of typhoid fever, which has been epidemic in Clayton this summer, which has caused at least seven deaths there and is reported to have caused more than five deaths elsewhere from the disease contracted at Clayton; it is to be noted that among the first cases in this epidemic, were individuals in houses, the sewage from which is discharged illegally through the short sewer of illegal construction and into "French Creek" and that the water defiled at this point is very easily taken into the water mains by the intake pipe of the water supply of that town.

Respectfully submitted,
WILLIAM S. MAGILL, M.D.,
Director, Hygienic Laboratory

In compliance with your order of December 1st, Inspector No. 7 of this Laboratory investigated the matter of an outbreak and epidemic of scarlet fever at Cornell, reporting to you thereon under date of December 8th, a copy of which report follows:

ALBANY, N. Y., *December 8, 1909.*

HON. EUGENE H. PORTER, M.D., *State Commissioner of Health,*
Albany, N. Y.:

SIR:—In the matter of an outbreak of scarlet fever at Cornwall, N. Y., the correspondence in regard to which was referred by you, December 1st, to your Inspector No. 7, and in fulfillment

of your order to take charge of that situation, your inspector now reports.

The health officer of that district states that the first case of scarlet fever was reported to him on October 2d, and that from that time to November 5th seven cases were placed under quarantine by him.

On November 5th the health officer decided that it was necessary to close a school in his district to prevent the spread of further contagion and so ordered.

On the following day, at a meeting the board of health refused to indorse the order of its health officer or to take any measures toward the closing of that school, and also refused to take any action toward the closing of a dairy that was suspected of distributing the scarlet fever infection.

The daughter of the principal of that school had been taken with scarlet fever on October 31st and the principal of that school, the father of the child, was exceedingly rebellious to the confinement of quarantine established by the health officer.

The health officer was insistent that in the presence of this scarlet fever outbreak it was important that the principal be maintained in quarantine more than three weeks. The principal, president and the secretary of the board of education of Cornwall were exceedingly active in insisting upon such measure of quarantine and in spite of the most earnest effort and insistence of the health officer, the board of health permitted the principal to resume his duties at school at this period; and absolutely refused the most implicit demands of the health officer to forbid the principal's release from so short a quarantine.

Local agitation as a consequence of this matter produced correspondence and complaint to the State Department of Health, as a result of which an expert of the Department was sent on November 11th to examine into the situation.

Your expert reported an outbreak of scarlet fever and directly stated to you that a milkman, still suffering from scarlet fever, was supplying milk to houses in Cornwall, and that practically the original cases of scarlet fever could be directly traced to this milk supply.

As a result of this report, you instructed the health officer of Cornwall on November 13th to prevent the handling of milk by

any member of the family of that milkman, to assure that the milk utensils were not handled by that family, or else to stop the sale of all that milk.

You instructed the health officer to assure a sufficiently long quarantine to prevent any possible contagion by the too rapid release of such cases.

Subsequent complaint to the Department brought you information that your instructions of November 13th were not carried out and an explicit statement to that effect was telegraphed you on December 2d, in reply to your letter of the preceding day, asking for such statement, if it were true.

On December 1st you had already requested from the health officer an immediate and detailed report and explicit statement of the manner in which your instructions of November 13th were carried out by him. The health officer's reply thereto, under date of December 3d, was received on December 4th and referred to inspector No. 7 late that night, and to the matter of that report your personal attention is respectfully invited.

In substance, this report establishes that at the time of its writing thirteen cases of scarlet fever had occurred, and that the twelfth case in this series, the symptoms of which manifested themselves on November 29th, was fatal, death having occurred December 3d.

On reading this report of the health officer it was manifest to your inspector that a situation of sufficient gravity to demand immediate and personal attention existed at Cornwall and he went there on Sunday, December 5th, meeting the health officer by telegraph appointment. The point of prime importance in this meeting was to determine why your orders of November 13th to that health officer had not been complied with and to assure compliance with all instructions of this Department on his part in the future.

It was found that the health officer was a young, active, intelligent sanitarian who wished to comply with every recommendation of the State Department of Health, and who understood how to render valuable assistance to this Department in handling of such outbreak of epidemic disease, but it was apparent that every intelligent effort of this health officer was nullified by the inaction or absolute opposition of the local board of health; and it was also

apparent that this attitude of the local board of health was more or less directly influenced by the activity of the local officers of the board of education of Cornwall.

Underneath this whole situation it was distressingly evident that the interest and efforts of citizens of Cornwall, exemplified in the manifest actions of the officers of the board of education, had been unduly exercised to direct attention away from the possibility of contagion of this scarlet fever through the school and to antagonize every effort of the health officer to suppress at least this factor of contagion.

To fix immediately the attitude of the local board for the future, relative to any communications they might receive from your Department and to determine your future line of action relative to the health officer, your inspector requested the president and other members of the local board of health to read specified sections and articles of the Public Health Law and instructed the health officer to report to you by telegraph not later than the morning of December 7th to what extent he had been fully authorized by his local board to carry out your instructions. The telegram of this health officer, under date of December 7th, is herewith submitted, together with all of the correspondence that you referred in this matter to your inspector No. 7.

Yours very respectfully,

WILLIAM S. MAGILL, M.D.,

Director, Hygienic Laboratory

In November, 1909, as a result of conference with first the chairman, and subsequently the entire body of members of the Saratoga Reservation Commission, the complete investigation and analyses of the mineral waters of Saratoga were undertaken by your Department, and by your order the Laboratory Division was charged with this work.

Your agreement with the Saratoga Reservation Commission was made in the middle of November and the investigations undertaken by the Laboratory Division, commenced on November 19th.

A preliminary report, embodying the work done by that division up to the end of the year, was submitted to you under date of December 29th, and by you transmitted to the Saratoga Reservation Commission. Copy of this report follows:

ALBANY, N. Y., *December 29, 1909.*

HON. EUGENE H. PORTER, M.D., *State Commissioner of Health,
Albany, N. Y.:*

SIR: — In accordance with your order, the examination of the mineral waters of Saratoga has been undertaken by the State Hygienic Laboratory and the preliminary work in that connection is now completed.

The Laboratory has maintained a staff consisting of the Chief Chemist, two assistants and a stenographer constantly at work in Saratoga since receipt of your order.

Thirty of the springs have been visited and twenty-seven samples have been collected and the bacteriological analyses of these samples have been completed.

The mineral analyses of these waters cannot be completed for some time.

As a preliminary statement, subject to revision and control of the completed analyses, it is possible for us to say that the waters of Saratoga can be classed in three groups.

First, a water very moderately charged with sulphuretted hydrogen. Of this group there seems to be but one spring of general utilization and knowledge.

Second, a group of waters more or less impregnated with iron. In this group are perhaps four springs, some of which were formerly well known and popular for their iron waters. The water in such springs, however, has receded so far as to render the practical use of the water exceedingly difficult and their actual use has been for some time suspended.

These waters apparently have never been bottled, but their use has been quite local and for drinking at the spring by visitors.

Third group would include by far the majority of all the spring waters of Saratoga, which are of the class distinguished as alkali saline waters.

There may be twenty-five springs of water of this nature that are, or have been, used by the public. The waters from the various springs would be arranged in this class according to the strength of their mineral content in general direct ratio to which would be their therapeutic qualities.

Five or six of these waters have sufficiently marked quantities

of mineral salts to be distinctly intestinal evacuents and are quite generally distinguished as cathartic waters.

Following the first five or six of these saline waters would come in successive diminishing therapeutic value several waters, the use of which would be mildly laxative or indeed of so mild a therapeutic effect as to be merely pleasant and useful table waters.

In a large number of cases no actual exploitation of mineral springs exists and the actual exploitation of mineral waters from various springs in Saratoga does not furnish any basis correctly representing the qualities of the waters exploited; that is to say, that spring waters now exist at Saratoga unexploited, that are equal or perhaps superior to several waters from springs in Saratoga of a very great exploitation.

The majority of all of the waters of the third group are saturated with carbonic gas and some of them contain this gas under pressure. The number of these latter waters, however, has been greatly diminished and the pressure of such contain carbonic acid and consequently the quantity of contained gas is enormously diminished; possibly, by the gas pumping enterprises in actual operation in Saratoga.

It is strikingly apparent that changes in the conditions of gas pressure in the mineral water basin of Saratoga have very seriously affected the output, the conditions of flow, the relative mineralization and consequent therapeutic value of a large majority of the spring waters in the third group, and this detrimental effect is quite largely responsible for the discontinuance of exploitation of many of these springs.

The inspection now completed of all of these springs and their actual conditions of exploitation and care reveals a very general condition of neglect to develop the opportunities of these mineral springs, to protect and maintain the value of these waters when once developed and a very wide-spread lack of intelligent direction, foresight and administration on the part of the private companies or individuals controlling these waters.

The loss of flow and of gas to such a point that a number of springs have gone out of existence is a striking example of lack of intelligence and foresight alluded to. More than this, many

of these springs have not been cased or piped, or repaired for many years and in a number of cases definite knowledge as to the kind of pipe or even of the depth of the spring is no longer to be found in the possession of the owners of the property. In many cases there is no modern or sanitary provision for obtaining the water from these springs.

The bacteriological analyses in your Department show that of the twenty-seven waters examined, three give evidence of so great pollution by fecal organism as to render them unsafe for human consumption, and it may be said that these three so badly-polluted waters are far from being from springs of lesser exploitation.

The preliminary investigation of the springs, plants and methods of exploitation of the mineral waters thereof has furthermore given evidence that the exploitation of some of these waters is not above suspicion of fraud.

It is a very general custom in the bottling of the spring waters at Saratoga to supercharge the waters with carbonic acid gas.

In the case of one water it is proven that an addition of chemical substance to the water furnished by the spring is the constant practice in the exploitation of that mineral water. In the case of at least one other water a portion of the chemical constituents of the natural water is removed before the water is bottled and its use exploited.

In a number of establishments, some of which are exploiting their mineral water on a very large scale, an arrangement of pipes, valves and tanks exists that would permit the constant practice of adulteration of the spring waters or of even manufacturing a so-called mineral water from fresh water and chemicals, and your attention is invited to the stenographic report of the investigation of this Department as an indication of the evidence which might permit a charge of fraudulent practice in some of these cases.

It is remarkable to find that the administrative intelligence encountered in the actual exploitation of the mineral waters of Saratoga is very far below that of successful exploitations in Europe. The lack of care of the premises is striking to the eye of the casual visitor. The lack of information on the part of owners or managers concerning their own spring almost surpasses belief and the inability of some of them to protect their own min-

eral water from fecal pollution is evidenced by our analytical data thus far obtained.

Respectfully submitted,
 WILLIAM S. MAGILL, M.D.,
Director, Hygienic Laboratory
 LEONARD M. WACHTER,
Sanitary Chemist

Analytical Data of Water Supplies — Saratoga Spring Waters

SOURCE	Date	Taken from	Bac- teria per c. c.	B. COLI TYPE +=PRESENT --=ABSENT			Bac- teria No.
				10 c. c.	1 c. c.	1-10 c. c.	
Chief spring.....	11/19/9	Blow-off of well on outside of building.....	28	—	—	—	2779
Carlsbad spring.....	11/19/9	Cock at the top of main casing.....	9	—	—	—	2780
Geyser spring.....	11/19/9	Tap over sink in house at Geyser spring.....	7	—	—	—	2781
Vichy spring.....	11/19/9	Bottle filler of bottling machine at Vichy plant.....	1,900	+	+	+	2782
Vichy spring.....	11/30/9	Wooden duct leading into pit at west end of bottling establishment.....	7	—	—	—	2810
Vichy spring.....	11/30/9	Southeast corner bottling establishment.....	3	—	—	—	2811
Original Lincoln well.....	11/19/9	Disconnected pipe on pump discharge.....	2	—	—	—	2788
Patterson well.....	11/19/9	Faucet near pump in the cellar of Patterson well.....	2	—	—	—	2789
Star well.....	11/19/9	Overflow of Star spring.....	670	+	+	—	2792
Star well.....	12/ 9/9	Overflow of tube at Star well.....	950	+	+	+	2831
Magnetic spring.....	11/20/9	Pitcher pump.....	210	+	—	—	2797
Peerless well.....	11/20/9	Discharge end of pipe inside building.....	95	—	—	—	2798
Eureka White Sulphur.....	11/20/9	Sample was taken by dipping the water into the bottle.....	190	+	—	—	2796
Eureka colonade.....	12/16/9	Overflow of iron well.....	2	—	—	—	2843
Eureka colonade.....	12/16/9	Overflow from Lithia well.....	150	—	—	—	2846
White Sulphur spring.....			90	—	—	—	2848
Arondack spring.....	11/30/9	Outlet of pump at about 200 feet northeast bottling plant.....	47	—	—	—	2813
Arondack spring.....	11/30/9	Fresh-water spring at the overflow pipe.....	1	—	—	—	2814
Seltzer spring.....	11/20/9	Outlet in yard of the Seltzer spring.....	26	+	+	+	2793
Seltzer spring.....	12/ 2/9	Overflow at Seltzer spring.....	2,000	+	+	+	2817
Seltzer spring.....	12/10/9	Waste from tube of Seltzer well.....	7	+	—	—	2837
High Rock.....	12/ 2/9	Discharge from pump at bottling plant.....	275	+	+	+	2818
High Rock.....	11/20/9	Pump.....	750	+	+	+	2791
Putnam No. 2 spring.....			55	—	—	—	2839
Governor.....	11/20/9	Hand pump. Is the new or Governor well of the Saratoga Star Bottling Company.....		+	—	—	2794
Governor.....	12/ 9/9	Hand pump on the Governor well.....	16,000	+	+	+	2832
Emperor.....	12/10/9	Emperor well on the Emperor, Seltzer property.....	70	—	—	—	2838
Emperor.....			11	—	—	—	2839
Excelsior spring.....	12/12/9	Pipe where barrels are filled in the pit.....		—	—	—	
Congress spring.....	11/19/9	Pipe over tank on upper floor of Congress Spa.....	49	+	—	—	2790
Congress spring.....	12/15/9	Pipe discharging into tank.....	5	—	—	—	2844
Quivec well.....	12/17/9	From small temporary branch near top of inner tube.....	4	—	—	—	2845
Champion well.....	11/19/9	Tap on pipe of Champion No. 2.....	2	—	—	—	2783
Champion well.....	11/19/9	Pool near railroad. Water flowing around casing of Champion No. 3.....	10	—	—	—	2784
Victoria tank.....	11/19/9	Galvanized tank in second floor of bottling establishment.....	300	—	—	—	2785
Victoria tank.....	12/ 1/9	Faucet on discharge pipe of steam pump in boiler room.....	20	—	—	—	2816
Victoria spring.....	12/ 1/9	At outlet pipe about 2 feet westerly of tube.....	85	—	—	—	2815
New Red well.....	12/ 9/9	Drip in pipe in pit drawing water from the New Red well.....	5	—	—	—	2836
Old Red well.....	12/—/9		4	—	—	—	2847
Old Red well.....	11/20/9	Outlet in pavilion.....	4	—	—	—	2795
Adams well.....	11/19/9	Overflow of Adams well.....	5	—	—	—	2786
Hathorn well.....	11/19/9	Faucet in pit of Hathorn well.....	2	—	—	—	2787
Hathorn spring.....	12/ 3/9	Faucet at Hathorn spring office. Is water from village supply.....	60	—	—	—	2819

CANCER LABORATORY

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CANCER LABORATORY

BUFFALO, *February 4, 1910.*

HON. EUGENE H. PORTER, M.D., *State Commissioner of Health,
Albany, N. Y.:*

DEAR SIR: — In accordance with the provision last made for our maintenance, I have the honor to transmit herewith the Tenth Annual Report of the New York State Cancer Laboratory of the Department of Health for the year 1909.

In the Eighth and Ninth Annual Reports of this laboratory it was pointed out that experimental cancer research had reached a point where from now on we might confidently expect that the fundamental facts underlying immunity in cancer might be at any time applied to the treatment of human beings. It was also pointed out that the successful treatment of animals in the laboratory with the blood of recovered animals did not at once point the way to the treatment of human beings by an antiserum, but that the process of spontaneous recovery after inoculation with cancer was really a form of vaccination, and that processes of vaccination might ultimately be successfully and safely utilized. For this reason we asked the Legislature to increase the funds of the laboratory so that we might maintain a few patients, and undertake experiments with this end in view. Unfortunately the Legislature did not see fit to give us this means, and it is to be feared that the methods which we have pointed out as applicable will be first used in other quarters than in this laboratory, in which the method was practically originated and developed. Particularly one line of experimentation, which has been conducted in this laboratory, offers a very hopeful prospect for the application of the vaccination treatment. It has been found that in a certain form of cancer in rats, where the tumor was inoculated but once into the animal, it usually grew to a fatal termination. The course of this process could be changed by repeated inoculations at stated intervals. For instance, animals were inoculated, in ten days inoculated a second time, in ten days again a third, and in ten days more a fourth time, up to six times. The result was that as time passed each inoculation would begin to grow making its appear-

ance in sequence. When three or four of the tumors had reached a certain size, spontaneous recovery would set in and the tumors would disappear, leaving the animal immune; whereas animals inoculated with but one inoculation would by this time be carrying large tumors, and shortly after die. It thus appears that where the resistance of the animal is not sufficiently awakened by one inoculation of the tumor, this resistance can be heightened by repeated doses and, in a considerable portion of cases, immunity can be raised to a point which will bring about a cure. It is needless to point out that this process of repeated vaccination, which has cured in the proportion of twenty-five to forty in rats, might well be applied to those cases of late cancer in human beings in which surgery has nothing to offer and the outlook is hopeless. Such experiments can, of course, be undertaken only where patients are under the direct eye and control of the experimenter. If suitable quarters for such patients could be found there is no doubt that there are many who would avail themselves of the opportunity to try this treatment.

As we have pointed out from year to year, cancer in the State of New York, and, in fact, in the United States and all civilized countries, is steadily on the increase. The comparative statistics of cancer and tuberculosis in the State of New York for the last year are as follows:

	Tuberculosis	Cancer
January, 1909.....	1,169	535
February.....	1,152	521
March.....	1,362	588
April.....	1,398	566
May.....	1,256	578
June.....	1,137	582
July.....	1,126	598
August.....	1,036	575
September.....	956	619
October.....	1,087	617
November.....	1,083	597
December.....	1,186	658
	<hr/>	<hr/>
	13,948	7,034
	<hr/>	<hr/>

In the United States, from 9 per 100,000 of population in 1850, it had advanced in 1900 to 43 per 100,000, and in the registration area of the United States the increase from 1901 to 1906 per 100,000 of population is shown in the appended table:

	1901	1906
Registration area	64.5	70.8
Registration cities	65.2	75.6
Registration states	66.2	70.9
Cities in registration states.....	69.0	78.0
Rural part of registration states.....	62.7	62.6
Registration cities in other states.....	61.3	70.3

During the period 1901 to 1906 the distribution of cancer was as follows:

Cancer of the mouth.....	4,326
Cancer of the stomach and liver.....	51,398
Cancer of the intestines.....	14,934
Cancer of the female genitals.....	20,404
Cancer of the breast.....	4,683
Cancer of other and unspecified organs.....	32,697

It will be seen from this table that cancer of the intestinal tract, including the mouth constitutes more than half of all the cancer which afflicts mankind. It is not always possible to bring statistics regarding foreign countries down to the latest date, but Williams gives the following data for foreign countries.

Scotland, from 41.6 in 1861 to 107 in 1905.

Ireland, from 27 in 1864 to 79.3 in 1906.

Switzerland, from 114 in 1889 to 132 in 1898.

France, Paris, from 84 in 1865 to 120 in 1900.

Other cities, over 10,000 population, omitting Paris, from 76 in 1887 to 106 in 1900.

Germany, from 59 in 1872 to 71 in 1900.

Austria, from 37 in 1880 to 70 in 1900.

Hungary, from 26 in 1897 to 39 in 1903.

Italy, from 21 in 1880 to 58 in 1905.

Australia, from 14 in 1851 to 57 in 1901.

From this table it will be seen that there is a steady and serious increase in cancer in all civilized countries. The problem becomes therefore from year to year one of constantly graver import. It is therefore each year of greater importance that investigations, which are throwing light upon the nature and distribution of cancer, should be pressed with increased energy. It is furthermore necessary that the scope of such inquiries be as broad as possible. For this reason the laboratory has been actively engaged in an investigation of the distribution of cancer in the lower animals. The frequency of cancer in mice, rats, dogs, domesticated animals and cattle has already been pointed out, but some three years ago circumstances called our attention to the possible distribution of cancer in fish. There have been accumulating in the literature of cancer observations regarding the distribution of human cancer along water-courses and in rural districts which were poorly drained. Such a distribution is particularly notable in the United States, where cancer extends across the country in a belt which reaches south, on the Atlantic coast, about as far as the mountains of northern Georgia, and along the entire length of the Pacific coast states, whereas the southern and southwestern portions of the United States, with the exception of a narrow strip along the Gulf coast, are relatively free from the disease. Cancer is most frequent in the well wooded, well watered and mountainous regions of the United States, and at the time of the last census it was more prevalent in the rural districts than in the cities.

The suggestion that a possible contagion of cancer might be distributed through the medium of water has for some time engaged the attention of investigators, and it was this fact that led us to investigate the possible distribution of cancer in fish. It may be stated that our investigations have led us to a point which shows that this matter is one of greatest importance. Fish are subject to various types of cancer. We have found fish suffering from cancer of the mouth, cancer of the skin, cancer of the rectum, and various other types of cancer, including cancer of the thyroid gland. This latter affection is a very frequent occurrence in certain varieties of fish, i. e., the trout family. It is a remarkable coincidence that the area of the United States, which includes the greatest concentration of human cancer cases, is almost identical

with the area through which the various members of the trout family are distributed.

Feeling the importance of this question we sought, a year ago, the co-operation of the Commissioner of Forest, Fish and Game, Hon. Mr. Whipple. With his co-operation we have begun an investigation of the distribution of cancer in fish in the State of New York. Realizing further, that for a comprehensive view of this important question, we should not limit our observations to the State, we have sought and found the very hearty co-operation of the National Commission of Fisheries, Hon. George M. Bowers, Commissioner. Mr. Whipple has entered most heartily into this investigation, and has referred in his annual report to such services as we have already been able to offer his department. The United States Commissioner of Fisheries has stationed at the Buffalo laboratory one of the equipped assistants of his own department, who, with his special knowledge of matters pertaining to fish, is rendering most valuable assistance. This investigation has just properly begun. We are not yet ready to publish our results, but we are willing to state that they already appear to us to be of very far-reaching import, and that it would be a very serious matter if the progress of this work should be delayed for want of funds. In combination with the work, which we are already doing upon the question of the cure of cancer, the addition of this important investigation of the distribution of cancer in fish, has placed upon us increased responsibilities and expenses which we cannot meet with the present limited appropriation of the laboratory.

The United States Commission of Fisheries has placed at our disposal apparatus which represents an outlay of a thousand dollars. In order to utilize this apparatus it was necessary for us to install in the laboratory a refrigerating plant. The funds of the laboratory were so low that it was impossible to do so without personal sacrifice, and in order to meet this important and necessary outlay, all of the members of the staff, who could possibly make such sacrifice, relinquished a month's salary, and in this way about a thousand dollars was raised within the laboratory itself.

The work which we now have in hand is of such importance, and we believe will lead to such important results, that for the

coming year the laboratory will have to have a larger appropriation than was granted last year. Our request for increased funds last year, owing to the pressing need for economy, was not favorably regarded by the Legislature. A statement of the expenses of the last year is as follows:

1908.

Sept. 30. Balance	\$1,095 37
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1909.

Sept. 30. Stock and material	2,737 55
Equipment	470 48
Expense	3,055 19
Salaries	10,872 39
Total	<u>\$18,230 98</u>

1908.

Sept. 30. Appropriation 1908-09	\$18,000 00
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1909.

Sept. 30. Balance	230 98
Total	<u>\$18,230 98</u>

During the last year it has been found necessary for us to curtail the work of the laboratory in important directions. For instance, the chemical department has practically had to be closed. Dr. G. H. A. Clowes, the chemist of the laboratory has withdrawn from continuous service and will give his services for six months of the year, his salary being reduced to \$1,500. The necessity for this step is greatly to be regretted. Dr. Clowes has in the past rendered the most valuable services to the laboratory, but the insufficient funds and the press of other work has rendered this step necessary.

We require for the coming year an appropriation of \$35,000. The microscopical department of the laboratory, owing to the large

number of fish which it is necessary to examine must have added two assistants at \$75 and \$50 per month. An assistant chemist at \$1,200 and an extra laboratory boy for chemical department at \$25 a month are needed. Supplies and necessary equipment for chemical and microscopical departments will require \$2,000; maintenance of cold storage plant for refrigerating, experimental apparatus for fish, water and electricity, together will call for \$800. The beautiful building given by Mrs. W. H. Gratwick, of which the State has had the use since its erection in 1902, owing to the shortness of funds and the pressing need of utilizing every cent for research work, has fallen out of repair to a degree which can no longer be disregarded. The roof requires repairs, in many places the water leaks in through the window sills, which must be reset, and the brickwork in many parts of the building requires repointing. The woodwork and benches, owing to the severe usage of eight years of continuous service, require extensive repairs. The improvements to the lighting system in the building and the installation of an adequate telephone system are urgent necessities and for the above enumerated purposes, \$1,200 should be expended. If the work which we are doing in conjunction with the Department of Forest, Fish and Game is to be conveniently and properly handled, the laboratory should have facilities in the immediate neighborhood of Buffalo for maintaining fish for purposes of experimentation. The expense of maintaining fish in running water where the city water supply is used is prohibitive, and in the summer this cannot be done owing to the rise in temperature of the lake water. A suitable supply of spring water can be found near Buffalo, without question, and the ground around it and the right to use the water should be leased for a period. A temporary building with necessary storage troughs and other necessities should be erected and an attendant stationed on the ground. The cost of this for the first year would be \$3,000. The prosecution of this work entails investigations outside of the laboratory which necessitates traveling expenses. It has already been necessary during the past year to draw on the funds of the laboratory for repeated trips to different parts of the State for the purpose of inspecting and collecting materials. During the coming year the necessity for sending assistants to different locali-

ties to collect material and make observations, as well as the necessary inspections by the director of the laboratory, transportation of scientific instruments and materials, and expenses incident thereto, will require a fund which should not be less than \$2,000.

As we strongly urged the Legislature in our eighth and ninth annual reports, the time has come when we should begin experimentation with human beings. To do so it is necessary that a number of patients should be maintained for this purpose. The only basis on which work of this kind can be done is where the patient submits himself for experimental purposes, and it is necessary under such conditions that the State should pay the maintenance of the patient. It is impossible to undertake systematic work of this kind unless a sufficient number of patients can be placed under observation, to make the figures sufficiently conclusive to corroborate any conclusions which may be reached. Funds sufficient to enable us to maintain ten patients is the least amount which can be of value if this work is to be undertaken. The cost of maintaining special cases of this kind, including the expense of the necessary assistants to carefully watch, control and observe the various experiments to be made, would be not less than nine dollars a week. Therefore, an item of \$5,000 is necessary for this purpose.

The needs of the laboratory for the coming year, if we are to fulfill the purposes for which the State is maintaining it, are as follows:

Appropriation for the heating, lighting, maintenance and conduct of the laboratory as at present instituted	\$18,000 00
Additions to the staff necessitated by the increased scope to cover the investigation of fish, two assistants	1,500 00
Supplies for microscopic and chemical departments . .	2,000 00
Staff of chemical department	1,500 00
Station for the maintenance of fish for experimental purposes	3,000 00
Fund for field work in the investigation of fish, including traveling expenses	2,000 00

Expenses for power and water for closed circulation and repairs to building.....	\$2,000 00
Fund for maintenance of patients for experimental work on treatment for cure of cancer in human beings.	5,000 00
Total.	<u>\$35,000 00</u>

The staff of the laboratory is practically unchanged: H. R. Gaylord, Director; G. H. A. Clowes, Consulting Chemist; C. A. Macclay, Secretary; F. W. Baeslack, Assistant in biology and histology; D. R. Averill, Assistant in photo-chemistry; F. A. Payne, Janitor, and three assistants classed as laborers.

Respectfully submitted,

HARVEY R. GAYLORD

Director

PROCEEDINGS OF NINTH ANNUAL CONFERENCE
OF
SANITARY OFFICERS OF THE STATE

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**Proceedings of the Ninth Annual Conference of Sanitary
Officers of the State of New York, Convention
Hall, Rochester, November 10-12, 1909**

The Conference was called to order by George W. Goler, M.D., Health Officer of the city of Rochester, Wednesday, November 10, 1909, at 2:30 p. m.

OPENING ADDRESS BY DR. GOLER

I am sure on behalf of the Health Bureau, I am glad to extend to all of my fellow sanitarians a most hearty welcome to Rochester. I think we have only to look at the program which has been presented for our consideration, to extend our thanks to Dr. Porter, for the distinguished men he has succeeded in bringing here to discuss these questions before us.

Not only are we to hear these visiting sanitarians, but we are also to take part in this congress ourselves, and through the reading of the papers and the discussion, we are to find out the newer ways for the prevention of disease, and the road to health.

You know, to-day, we are not only interested in perfecting the data of disease, but we are interested in finding the way to health; so that as time goes on we may realize, as Pasteur said, that it is within the province of man to banish infectious diseases from the face of the earth.

Again, I bid you hearty welcome.

I have again the pleasure of introducing, in the absence of his honor, the mayor, one who is chosen to extend the greeting of the city of Rochester, and he will come in his three-fold capacity, in his own person, and as the representative of the mayor, and as the secretary of the mayor: I take great pleasure in presenting Mr. Charles E. Ogden, secretary to his honor, Mayor Hiram H. Edgerton, of Rochester.

ADDRESS OF WELCOME BY MR. OGDEN

LADIES AND GENTLEMEN OF THE CONVENTION — I should like to say in opening, that it is a very rare privilege and pleasure to welcome you to Rochester, but I can say so only in a qualified sense, for yesterday when his honor was forced to be present at another meeting it was my pleasure to welcome to the city of Rochester the convention of Women's Clubs; and after that I must confess you are somewhat tame, because they represent so much, and because they have such a lovely way of representing it; and because you represent so much, and have such an odious way at times of representing it. But in all seriousness the city of Rochester is delighted to have you come here and hold your meetings, and to feel that there is a representative body of men among us, which is interested in the broader, larger questions of life. And there is no question that goes home so closely and so thoroughly to us as that of our health. This is especially true of the cities, for city life is the problem of the present and the future. And how to maintain wholesome, healthful surroundings, and how to instruct the people so they will help to maintain wholesome and healthful surroundings, and how to inculcate in the minds of the country folk and the young people, and the students of sanitary questions, what is best for them. These are immense problems, and problems which must have the careful attention of all philanthropists and patriots. And the city of Rochester realizes that while private philanthropy may do much, and while your intelligence and your personal effort may do much, and while the skill of the specialist and the student of anatomy may do much, yet after all, in the last analysis, the foundation of government must play its important part and bring home the practical application of what you have done, and what private enterprise has brought about. In other words, it must bring home that practical application to the affairs of all the people.

We know that yellow fever has been practically blotted out of Cuba, and it was done after government took hold. We know

that in the reduction of diphtheria and typhoid that government has played its very important part. Therefore, the government of the city of Rochester, enveloped as it is in the health bureau of which it is justly proud, is very glad to have you folk here, that we may learn, and that you may give us an uplift along these truly important lines, in the affairs of our city, and in the affairs of all mankind.

We are not afraid of you at all. We have measured up the probability of your painting the town red, and we have decided that we are not afraid. We are not afraid of your theories; we are not afraid of your highest looks into the future; we are not afraid of your enterprise, for Rochester at present is in the halo of glory of its own enterprises, and it is especially triumphant in its commercial, industrial and business life. But while it is expanding and broadening, it does not wish to forget for a moment, its indebtedness to the higher walks of life; and to philanthropy in its broadest and best sense.

Rochester, as we believe, is the most beautiful and the most ideal city in the world. Rochester is progressing and expanding; and is proud as proud can be of its location, of its business, of its enterprises, of its health, of all that goes to make a city large, beautiful and fruitful to live in.

Now, you see how swelled up we are in regard to Rochester. But, Rochester wants to be proud of its hospitality; and it wants you to feel that you are at home; and that it is our business to make you feel at home, and to give you a welcome in every sense of the term. We extend to you the freedom of the city. I do not know what that means exactly, but we extend it to you nevertheless. Let me implore you to make the most of it. And we have a little motto here, "Do it for Rochester." We are trying to do everybody for Rochester. We will make the same attempt upon you, but, get back at us and "do" Rochester for all it is worth.

And in behalf of the mayor of this municipality and in behalf of the health association, and in behalf of all the citizens of Rochester, I again extend to you the heartiest, happiest sort of a welcome that it is possible for me to do and to wish for you great

results from your deliberations, and a period of genuine enjoyment while you are within our borders.

THE CHAIRMAN — Gentlemen, I think in response to what Mr. Ogden has said, we may say to him that we will "do" Rochester for its health's sake if in no other direction.

And now, I am like one of the Ephemerides, that lives but for a brief period. I have had my moment, or my hour of pride. I simply take the toga of presiding officer from my shoulders, and place it upon one who has made the Health Department of the State of New York take its place among the States of the Nation, Dr. Eugene H. Porter, the Commissioner of Health of the State of New York.

REPLY BY DR. PORTER

MR. CHAIRMAN, MR. SECRETARY AND FELLOW SANITARIANS — I always feel when this portion of the program is reached, where welcoming addresses are given and appropriate and of course felicitous replies are expected, and it devolves upon me to take part in such pleasant exercises, I am always reminded of the story of the little boy who was sent by his mother to invite a woman friend to tea. The boy had evidently heard some conversation at home regarding the status of this to-be invited guest, and so he said to her, "Ma would like to have you come over to tea at four o'clock this afternoon, and have it over."

But, really, while the ordinary messages of greeting are without any further significance than that given by the courtesy which prompts the speech, there is something in our welcome here this afternoon, it seems to me, that might fittingly require a few words in reply.

It is not in this beautiful hall where we are gathered, nor in the audiences that may hereafter assemble during the sessions of this Convention; nor in this kindly and eloquent speech to which we have listened, that we must seek for the deepest significance and meaning of our reception in this city of Rochester. Underlying all, and as a foundation for all, lies the splendid work, the splendid sanitary work done by the city of Rochester. And it is that which gives such a fitting and fixed significance to this reception.

Rochester has entered upon the road of sanitary education, enlightenment and progress. In her work is beginning to be illustrated the truth that sanitation concerns itself with all the affairs of men. In the work of the mayor and the common council of Rochester, in the efforts of the chamber of commerce, with its hundreds of active and intelligent members, in the work of the health officer and public health association, and in the work of many private citizens, we find advancing in Rochester a spirit of intelligent, comprehensive, sympathetic understanding of the development of sanitation, which is lacking in many of the towns of our State; and so in this welcome we come to the realization that our fellow citizens are beginning to recognize that the threads of

sanitary science run in increasing numbers through our complicated modern civilization, and also that what is for the interest of one, is in the interest of all.

And, so, I think we can say in reply to the representative of his honor, the mayor, that we are glad to be here in Rochester, and that as sanitarians we regard the city of Rochester as one of the jewels in the Empire State.

My friends, I need not say how glad I am to be here this afternoon, and to be able to greet in friendliness and accord with those members of the Health Department that we are not able to see very frequently at Albany. We have tried to the best of our ability to provide for you a practical program, and as you will note, by considering the names of the various speakers, you will see we have some of the most eminent leaders in sanitary matters to be found in the United States.

I have no doubt that this Conference will be one of the most successful of any we have been able to hold.

There is one announcement of importance which I think will interest most of you, which I would like to make before introducing the next speaker; and that is in relation to courses of instruction for health officers. That is a matter concerning which many of you have spoken about to me. It is something which has been under consideration in this Department for some months, and some time ago you will remember, we held a series of sanitary institutes throughout the State. While they have been discontinued, it was not my purpose to finally discontinue them; on the contrary, it was my idea that there was enough support from the health officers of the State to make us conclude that they warranted their continuance; and so in the last few months in Albany, we have been considering this matter.

We will discuss it later this afternoon. If there are too many subjects, or the course is too long, I wish you would give me your frank opinion about it, and have no hesitancy in saying what each of you as an individual would like in a school of this kind.

Of course we labor under some disadvantages. If you were able to follow your inclinations you would come and spend two or three weeks there at a time, but most of us are practising medicine and it is impossible to leave such a practice for such a period. So

we must endeavor to make short visits, and crowd in as much as we can in a limited period.

Here is a tentative program: These courses will be held at Albany, Staten Island and Ithaca. They will be held throughout the year. Their duration will be five days, from Tuesdays to Saturdays.

Now, that will not interfere with any one of you coming to Albany or going to Staten Island or to Ithaca, arriving one day and leaving the next day. If we are unable to give you the full course, we will give what we can; so, while, if you could stay the five days, we could complete the course laid out, yet do not hesitate to come because you cannot stay the full time. If you can give one, two or three days, you will be as welcome as if you came to stay the entire time.

There will be some lectures on inspection, establishing and controlling a quarantine, vaccination, disinfection, and so forth. There will be laboratory courses daily, morning and afternoon.

Under the first heading, we have the following:

- 1 Sanitary examination of water
 - a Field survey
 - b Where and how to collect samples
 - c Care of samples in transit
 - d Determination of physical properties
 - e Chemical analysis — methods and applications
 - f Bacteriological analysis
 - g Demonstration and exercises in the interpretation of the results of water analysis
- 2 Clinical microscopy
 - a A short exercise in general bacteriology
 - b Making and use of usual culture media
 - c Preparation and inoculation of cultures for diagnosis
 - d Preparation and use of bacterial stains
 - e Isolation of specific germs from a mixed culture
 - f Preparation of slides, smears and swabs for work in diagnosis of microbes
- 3 Diagnosis of blood
 - a Methods of collecting, preserving and transmitting blood
 - b Use of the centrifuge, cryoscope and hemoglobinometer

- 3 Diagnosis of blood — Continued
 - c Blood counts and formulæ and interpretation
 - d Determination of phagocytic and hemolytic properties of blood cells and sera
- 4 Diagnosis and differentiation of the microbes of diseases
- 5 Special methods and special diagnoses
- 6 Studies and exercises in the production, valuation and use of vaccines and the antitoxic sera of tetanus and diphtheria.

In addition to these short courses, a long course of six weeks duration will be offered by the State Hygienic Laboratory at Albany during the summer.

In addition to that, after consultation with Dr. Doty, health officer of New York, we have arranged a course, owing to his thoughtfulness, on Staten Island.

Now, Dr. Doty authorizes me to offer a course in quarantine inspection, diagnosis of the various diseases that occur there, and full opportunity of seeing how the work is done at quarantine stations. He further offers accommodations and maintenance during the stay there of two or three days, without expense to the health officers.

Now, it seems to me with these various courses open to the health officers of the State, that we should be able to make progress in practical lines. The course of Dr. Doty will not be ready until the first of March, next year. Our own course will be ready on the first of December of this year, so by the first of March next year, the State of New York and its Health Department will be able to offer practical instruction to its health officers that it has never reached before. And, yet, while this program may sound to you somewhat enthusiastic, somewhat ambitious, kindly remember we are just opening these schools, and give us that kindly consideration and forbearance that beginners are sometimes entitled to.

There is another matter on the program that some of you may not have noticed. On the last page of the program you will find a notice of a "smoker" to be held at the Powers House Thursday evening at 8:30. Do not forget it. That will be the social evening of the Conference, where we will have an opportunity to meet and get acquainted, and have a real old-fashioned time.

It is with no inconsiderable degree of pleasure that I introduce to you now, Dr. William S. Magill, the new director of the laboratory work in the State Department of Health, who will present the subject: "New Methods in Diagnosis and Treatment of Infectious Diseases." Dr. Magill comes to us with a large experience in this country, and with a still larger experience abroad, and with diplomas from Paris and Berlin. Bringing all his experience in practical work to us, I believe that under Dr. Magill's administration, the laboratory of the Department of Health of the State of New York will enter upon a career, where it should be placed, namely, in the front rank; and that the work done, both routine and research, will cause it to stand by such laboratories as those of the State Board of Health of Massachusetts.

DR. WILLIAM S. MAGILL — The Commissioner has made my task more difficult by his very pleasant introduction, which I hope I may merit.

NEW METHODS IN DIAGNOSIS AND TREATMENT OF INFECTIOUS DISEASES

BY WILLIAM S. MAGILL, M.D.

Acting Director State Hygienic Laboratory, Albany

It is not the purpose of this paper to present any general study of so large a scope as the title might indicate, but only to submit to your consideration a limited number of diagnosis methods of relatively recent development; to lay stress upon their ease of application; and to point out their valuable contribution to a positive knowledge of pathological processes and their consequent field of utilization in practice.

It will also be my effort to indicate the wider use of such methods than for diagnostic purposes only; in some cases I shall point with insistence upon the value of such methods in prognosis and in the control of therapeutic effort and effect.

The imperative importance of early diagnosis of tuberculosis is established. We are not here interested in the mere determination of the bacilli of tuberculosis in sputa or excreta, but in methods that shall unmask a beginning invasion of the organism by these bacilli: the precocious diagnosis of a tubercular infection.

There are various methods which reveal such infection in its initial stages with great reliability.

The use of tuberculin as a diagnostic agent dates from Koch's failure to establish its value as a general means of cure.

It was found that an hypodermic injection of a minute dose of tuberculin provoked a marked and prompt rise of temperature in a tubercularly reacting organism.

The exhaustive studies and perfections of this use of tuberculin have completely demonstrated its value as a diagnostic method; but have also revealed dangers and disadvantages of sufficient gravity to confine its application to specially trained observers.

It may be said in general terms that nine out of ten individuals infected with tubercle bacilli will evidence this fact by their reaction to the injection of tuberculin, almost immediately upon

the establishment of such infection in the organism, and throughout the entire duration of the organic resistance to invasion.

A characteristic rise in temperature subsequent to injection of tuberculin is quite positive evidence of tubercular infection of the organism tested. The failure of this reaction is not evidence of the nonexistence of such infection; but in general terms it can be said that the cases in which such failures are possible are limited to at least one in ten. Such a failure is generally due to the fact that the infected organism is so exhausted as to be no longer reactive. In such cases of course the clinical symptoms of tuberculosis are not deficient.

The studies of the rise in temperature of the infected subject tested by tuberculin have shown that this tubercular affection provokes a marked hypersensibility of its victim to manifest high temperature on slight provocation.

Based on this susceptibility to heightened temperature two methods of diagnosis are now used.

Often, at the first onset of tubercular invasion, it will be found that the muscular and mental activities of the day's work are sufficient to provoke in the infected individual a slight rise of body temperature above the normal during the late afternoon or evening. This fact is of ancient clinical observation and use in the early diagnosis of tuberculosis.

It is developed into a method of diagnosis when a suspected individual is directed to take moderate exercise for half an hour or more, with hourly observation of his subsequent temperature. A rise above the normal is strongly indicative of the existence of infection, if found to be a constant phenomenon under such conditions.

The second diagnostic method, based upon this characteristic rise in temperature, is widely used in France and seems to be of well proven reliability. It is based on the particular susceptibility of tubercular subjects, even in the earliest stages, to any dose of iodine.

The method consists in administering to a suspected subject a relatively small dose of iodide of potassium and carefully observing the temperature of the ensuing twenty-four hours. If the subject be infected with tuberculosis, a marked rise of tem-

perature is a quite constant phenomenon and a distinctly valuable point of diagnosis. Objection to this method is made as also to the use of the injection of tuberculin on the ground that the drug administered may facilitate the development of the pathological process. It can be answered, however, that such drug administration for purposes of diagnosis is not long continued nor often repeated and, therefore, not liable to cause permanent injury when skilfully used and observed. One of the advantages claimed for the administration of iodine as an aid in the diagnosis lies in the temporarily quickened and augmented pathological actions; frequently permitting the clinical detection of the true temporarily exaggerated symptoms. One need not too hastily descry a diagnostic method on the ground that its use for the time being exaggerates a pathological condition. No one would rationally regret palpation for determining the localized pain on the ground that it temporarily exaggerated the pathological compression of swollen tissues.

Because of the accusation — perhaps quite speciously made — of possible harm in the injection of tuberculin and the ingestion of iodine the use of these methods has remained quite limited in spite of their great utility and proven reliability for the precocious diagnosis of tuberculosis.

Experts in very different lines of investigation have developed such results that the value of the preceding methods has been overlooked.

With the same fundamental property of tuberculin to develop a specifically marked reaction in the tissues of a tubercular individual, efforts to avoid the production of a general reaction of such organism by eliminating from the test the introduction of any tuberculin into the general system have been most successfully made.

As the result of this line of experimentation, there have been established three diagnostic methods, all built upon this irritant property of tuberculin; but restricting to a minimum the area of the provoked reaction of the organism.

First, in order of time of the introduction is the conjunctival; second, the inoculated cutaneous; and third, applied-cutaneous reaction to tuberculosis.

These methods are alike in fundamental principles and approach each other in the value of their results for the remarkably early diagnosis of any organism reacting to tubercular infection. They differ merely in minor details and in the technique of the several diagnostic methods, as indicated by the name applied to each.

The conjunctival reaction is obtained when one drop of a one per cent. solution of well chosen tuberculin is cautiously instilled upon the temporarily inverted conjunctiva of an individual organically reacting to tubercular infection. Under proper conditions this reaction is shown by the intense reddening of the seat of instillation within a few hours, persisting from one to several days thereafter in practically all such infected individuals. The reddening of the thus instilled conjunctiva of a normal nontubercular individual is practically never observed.

Objection to the use of the conjunctival method is made by a claim that cases of serious complication of ocular tissues have resulted. One such case, about which a great deal was said and published in New York was found quite unfounded by the personal investigation of this writer. The men who have most thoroughly investigated this method — Wolff-Eisner and Calmette — and used it in very many thousands of cases, are strong in their showing that there is practically no harmful result to be feared in any case suitably subjected to the conjunctival test.

The enormous number of individuals examined by this conjunctival method in the hands of most expert observers has already permitted the collection of clinical data for establishing the use of this method, not only for diagnostic, but also prognostic purposes.

In speaking of this reaction it becomes my duty to point out a grave fault in many writings on this subject. The reaction is often referred to as the "Calmette Reaction" on account of the propaganda and use made of the reaction by that authority. Apparently no writer who criticises the reaction as dangerous has ever taken the trouble to know what the so-named reaction really was, for I have found one who appeared to know what sort of tuberculin Calmette used — a very vital point of this test if it is to be criticised as dangerous.

When Calmette took up his propaganda for the employment of the conjunctival reaction for the diagnosis of tuberculosis, he used a chemically precipitated and thus purified tuberculin in a standard solution and when he or his co-workers state the results of such tests as harmless you must remember that such results are from the use of a pure reagent. Subsequent writers seem to have utterly failed to consider the nature of the tuberculin as at all important. I have never been able to find one of these who knew anything about the kind of tuberculin used in the tests he so elaborately classed and criticised.

To avoid the criticism of possible harm to a valuable organ, the use of a cutaneous reaction is often advocated. By the simple process of scratching the epithelium and the application of a drop of the same solution of tuberculin to this insignificant wound of the skin, in fact the simplest sort of a vaccination operation at any chosen point of the tegument, the inoculo-cutaneous method of using tuberculin for the diagnosis of tuberculosis is carried out.

A zone of more or less intensity and diffused redness of the surrounding tissues is developed in the course of a few hours and persists for one to several days in all persons reacting to a tubercular infection.

In this method, as well as in the conjunctival, the clinical data accumulated would point to the great value of this test, for both diagnosis and prognosis. It may also be found quite effective in its operation, according to the employment of a tuberculin of human or bovine origin, to indicate the corresponding source of the infection of the subject submitted to this diagnostic method.

To avoid abrasion of the epithelium, which is requisite in the inoculo-cutaneous method, a salve containing the tuberculin is thoroughly rubbed into a selected portion of the skin and this application is quite sufficient to provoke a manifest zone of intense redness of the skin of individuals reacting to the tubercular infection.

All of the preceding three methods of diagnosing tuberculosis infection by the reaction of a selected and localized zone of tissue subjected to the activity of tuberculin, yield very prompt and valuable results and are subject to little objection or hostile criticism

of any standing. This may account for the very great rapidity of their spread into most extensive and very general use.

A French authority recently pointed out the ease with which this same line of investigation could be carried out by the simple application of a drop of the one per cent. solution of chosen tuberculin to any suitably prominent nasal turbinate or pharyngo-nasal mucosa. In this case a marked hyperemia of the point touched with the reagent, rapidly develops and persists at least thirty-six hours in the individuals reacting to tuberculosis infection.

In the use of provoked high temperature, the conjunctival, or the cutaneous, reactions to tuberculin, it is scarcely probable that the individual submitted for such method of diagnosis will remain in ignorance of its import and nature. The positive reaction to such tests is most patent to such individual and must reveal to him this ill omen.

To avoid the liability of the patient's inevitable observation of a positive diagnostic conjunctival, cutaneous or temperature reaction, it has seemed of great advantage to use the pharyngo-nasal mucosa for the chosen site for this sort of tuberculin application and observance of reaction. I have followed this as a method of procedure at my clinic at the New York Nose, Throat and Lung Hospital for more than a year with most satisfactory results. There is no difficulty of application of the reagent nor observation of any consequent reaction. The patient has no knowledge of the operation nor of its consequences. A long continued control of these cases by either a conjunctival or cutaneous test demonstrated the uniformity of results.

All of the preceding methods of diagnosis of tuberculosis involve the provoking of a phenomenon to be noted only by more or less constant and personal observation of the suspected individual. Such methods are inapplicable for long distance control.

Two methods of determining the existence of a tubercular infection without continued or personal observation of the patient have been employed and are proving their claims.

The first method in point of time is based upon the well-known Pfeiffer serum reaction, which was the precursor of the Widal test, now so universally used. You will recall the fundamental principle of that reaction, as established by the clinical observa-

tion: that the serum of an individual resisting or recovering from an invasion of infectious germs, when added in a very dilute form to an active culture of the specific motile germs of that particular infection, would soon arrest all motility and provokes the sedimentation of such germs in their liquid cultures.

By careful search and cultivation, strains of tubercle bacilli have been found, in which the individual germs are so motile that their fluid culture constitutes a really homogeneous suspension of the specific germs, with no sedimentation thereof at the bottom. To make with such culture a method of diagnosis of tuberculosis, it is sufficient to receive a minute amount of blood or serum of the individual suspected. This matter is added in diluted form to the liquid homogeneous culture above described, and if the organism of the source of such serum was reacting to tubercular infection, the phenomena of sedimentation of the bacteria takes place in their culture within a few hours, whereas no sedimentation results from the blood or serum of normal or practically non-tubercularized individuals. The accuracy of this method of serum diagnosis of tuberculosis is well established and it corresponds very closely to the percentage reliability value of the conjunctival and cutaneous reactions.

The second method of this kind, also requiring a small amount of blood from the individual proposed for diagnosis of a tubercular infection, is still in the hands and control of its originator and must be mentioned here subject to all the reservations of a progressive step of great promise, but not yet released from the laboratory proofing of its foster-parent. The foundation of this method lies in Calmette's observation that an infection of tuberculosis which provokes an active resistance of the organism, determines the appearance of an appreciable quantity of lecithin substance in the blood of such individual. By reason of the special quality of Cobra venom to fix such lecithin matter, by the use of a standardized solution of this venom the amount of lecithin appearing in the blood of the individual can be determined and fixes a diagnosis of tuberculosis.

This method holds out to us a most entrancing promise, for subject to verification and control of his series of experiments Dr. Calmette tells me that the amount of lecithin in the blood is an

index of the organic resistance. In this case the accurate determination of the amount by this method permits the exact measure of the state of infection at any given time. The degree of resistance being then known, an exact method for prognosis, as well as diagnosis, is here available and what is of far reaching import in medicine: a new power is placed in our hands when this method fulfills its promise; for by such accurate determination of a correct index of the progress of a disease we have for the first time a source of accurate knowledge and control of therapeutic efficiency.

The similitude of underlying factors involved in this work of Calmette and that which is bearing such ample fruit in the subject of hemolysis is striking, and leads at once to the next line of diagnostic work, the serum diagnosis of syphilis.

Our limit of time only permits the mention of the easy and positive demonstration of the specific microbe of syphilis, which we possess for a diagnostic method of any suspected tissue, and the very simple and practical method used by Noguchi, whereby a minute portion of blood or serum of any suspected case can be sent to great distances for a diagnosis of very great reliability which can be made in the laboratory in two hours' time. The value of this serum test is by no means limited to its use in diagnosis; for here, too, appears this new power in medicine which I have mentioned. By this method of serum test a positive knowledge of the state of the disease and an accurate measure of therapeutic efficiency is in our hands.

I must reserve for a future opportunity the demonstration of the resources of blood examination to show the onset of a diabetes long before any clinical symptoms of glycosuria, or to absolutely determine by a single examination any doubtful diagnosis of small-pox. But I must mention the power which the developed methods or cryoscopy have given us to foresee, forestall or control the critical periods of insufficient renal functions with consequently developing toxemia and our ability to accurately determine the degree of such impairment and select the impaired kidney.

Few realize the ease with which an examination of the blood will permit a diagnosis of pus formation in cases of pleurisy, appendicitis or cholecystitis and similar affections. The value of

such easily obtained positive knowledge makes it an imperative duty for the medical practitioner to obtain every available aid from these diagnostic methods.

THE CHAIRMAN — Discussion will be opened by Dr. Goler.

DR. GOLER — I trust it may be understood that the visiting physicians of Rochester may be invited to enter into this discussion. That is, those who are not members of the Conference will take part in this discussion. Only a few comments on this valuable presentation of this remarkable lot of data by Dr. Magill. I think there are only a few of us now who are able to take advantage of all the work that has been presented by Dr. Magill. In the diagnosis on tuberculosis, in particular, I think that what we need very largely is to be able to determine the ordinary case of pulmonary tuberculosis; not perhaps that class of case referred to by Dr. Elsner this afternoon, at the clinic, which only presented a lesion in one of the apices of the lungs; but we should have in mind these few facts: that when a patient presents himself to us with a little loss of appetite, and a little loss of weight, with a slight rise of temperature in the afternoon, with a slight rise in the pulse, we ought to give that patient the benefit of the doubt, and we should examine and re-examine that patient, until we became satisfied that the patient has or has not either tuberculosis or some disease that is threatening the life of that patient.

When we have done that, assuming that we apply to that patient one of the highest tests, or one of the second tests, either by rubbing in ointment, or tuberculin, and we get a reaction, are we in position then to say that is a patient afflicted with tuberculosis? By no means! If every man in this room would permit a mural to be made on him, how many would react? I know I would as I have already done so. But we have not tuberculosis by any means. I believe, gentlemen, we have got to be very careful indeed, how we interpret these reactions; that we cannot interpret them alone. We cannot interpret the subjective or objective symptoms alone, but we must take the whole picture, and by examination and re-examination, refine our evidence until we become satisfied what is the trouble. We do not make examinations. We make inspections. We say: "Let me see your tongue. Have your bowels moved? Fifty cents. Get out!" and that is why the patients are going to Christian Science to-day.

Over in a sanitarium in Germany is the sign that every man has a little tuberculosis, and every man has a little of it; and we must be very careful how we term a nonevident case of tuberculosis, the evident case. The only difference is we are paid about as poorly as the helper in a plumber's shop, and we are expected to give value received.

Just one other point with reference to tuberculosis, and that is this: a man or woman comes to a tuberculosis clinic, and after a painstaking examination and re-examination, that patient is said to have tuberculosis. He goes elsewhere, and they say he has not tuberculosis simply because there were not tubercle bacilli found in the sputum.

We hope to make a diagnosis, and every intelligent man should make a diagnosis of tuberculosis. Consider what it would mean if we could get a diagnosis with only one or two points of eruption, and we could get from the laboratory proof to the people who are the "doubting Thomases" who make us so much trouble.

DR. PORTER — Our time is limited, and we will throw the paper open for brief discussion, if there are any who wish to discuss it.

If not, we will take up the next paper on the program. The gentleman whose name is attached to that paper needs no introduction to this audience. He is President of the American Public Health Association, and I now have the pleasure and the privilege of introducing one whose work in Ohio is of national prominence — it is a matter of great privilege to present Dr. Charles O. Probst, Secretary of the State Board of Health of the State of Ohio.

PUBLIC HEALTH WORK IN OHIO

BY CHARLES O. PROBST, M.D.

Secretary Ohio State Board of Health

I presume that we are doing little or nothing along health lines in Ohio that you are not doing equally as well or better yourselves. Probably the difficulties we encounter in trying to extend and better our work you, too, have to meet. It is always helpful, however, to exchange experiences, and possibly in telling you something of our work and our hopes, plans and failures, something may be evolved in the discussion that will be useful to all of us.

Ohio is one of the largest states of our middlewest country. The territory is mostly flat or rolling with no mountains, and most of the land is under cultivation. Our interior streams are small, and much of the soil is of a clayey nature.

These topographical features have much to do with our sanitary problems as will be seen further on.

Our population is mostly native born, though we have quite a number of foreigners in our large cities, and there is a considerable sprinkling of blacks.

The State is divided into 88 counties and 1,360 townships. We have 69 cities, i. e., municipalities of 5,000 inhabitants or over, and 703 villages, or communities of anything less than 5,000.

Our health service consists of a State Board of Health of seven members and a secretary; and of local boards of health and health officers. Our cities have boards of health of five members and a health officer, but by a political trick, which has been very harmful, the Health Act was amended so that boards of public service may act as a board of health. Boards of public service have charge of all the city's affairs except the police and fire departments, and have little knowledge of health matters. This amendment was made solely to play political favorites and has been taken advantage of by many municipal authorities for that purpose.

In villages there may be either a board of health of five members or a health officer in lieu of a board of health, appointed by council but approved by the State Board of Health. In the

townships or rural districts the township trustees serve as a board of health and they appoint a health officer.

I speak of our organization in order to criticise some of its objectionable features in taking up the sanitary work this somewhat complex organization is doing — or is expected to do.

In the first place our rural health service is highly defective. Our township trustees are frequently changing, and for the most part have little knowledge of or interest in health matters. I would abolish township and village boards of health and replace them with a health officer directly responsible to the State Board of Health. A minimum salary for such officers should be fixed by law.

City boards of health should be independent of politics or parties. The health officer should be selected on merit, possibly with the approval of the State Board of Health, and should be removable for cause only. All other employees should be under civil service. Adequate appropriations for city boards of health by a fixed levy based on population, or by some other general plan, should be insured by State legislation. Money so provided should be absolutely at the disposal of the board of health.

I am happy to say that in a State where politics is in the air, in a State where Presidents seem to grow on trees, there has been absolutely no interference with the State Board of Health. Never but once did an applicant for a position try to make use of political influence, and he was rejected, and mainly for that reason.

I may now briefly outline the work of the State Board of Health along the lines of its chief activities.

We might broadly divide these into the protection of public water supplies, the prevention of communicable diseases, and the organization and support of local health agencies.

Our board has given special attention to the protection of public water supplies. With a few exceptions the geological conditions of our State are such that ground water in sufficient quantity for a large city is not available. Our only lake large enough for this purpose is Lake Erie. It is already more or less locally polluted by the sewage of cities upon its shores. It is impossible to fully protect our river supplies against pollution,

as we have no large uninhabited watersheds. As the result of these physical conditions the question of water and sewage purification has become of vital importance to us.

Seventeen years ago, by a fortunate circumstance and not from any provision on the part of our legislators we secured an act requiring that all plans for waterworks or sewerage, or for changes in either, must be approved by the State Board of Health.

The fortunate circumstance alluded to is this. In 1892 Hamburg was having its epidemic of cholera and a reported case in New York City created great public excitement. Taking advantage of this we rewrote our entire Health Act and introduced the bill in the Legislature then in session. The bill was a long one; no one read it; every one said "It's to prevent cholera," and so it was amended, without objections, so as to give our board the authority above referred to.

This power has been judiciously used. Although there is no direct penalty for violation of the act, it has been ignored in comparatively few instances, and, I am glad to say, by no city of any considerable size.

Under its provisions we have examined and passed upon 245 plans for waterworks and 303 for sewerage. By coercion, persuasion, or both, we have since the passage of this act secured the introduction of 43 municipal water purification plants and of 133 sewage purification works.

This work has built up our engineering department. From one engineer, whom we were unable to employ from lack of funds until 1898, we have grown to a department of four engineers and five assistants. With this help we have made rather complete sanitary surveys of all our streams, and a detailed study of all our water and sewage purification works.

We have been led by this in other directions than sewage. Many of our streams are polluted by industrial wastes. It has been our policy to aid manufacturers in finding proper ways for disposing of these. To this end we have and are carrying out continued experiments in waste disposal.

We found a way for drying by evaporation distillery slops and utilizing them for cattle feed, thus removing a nuisance and giving a handsome profit besides. We did similar work, but not so

successfully as regards profits, in converting acid iron pickling wastes into copperas with the removal of a nuisance and the settling of pending lawsuits. For some years we have been studying the purification of wastes from butter factories and creameries, of which we have a number. We have recently solved this problem in a fairly satisfactory way and hope to bring about the removal of many just grievances on this account.

For the past year we have been studying experimentally, with a special laboratory, garbage disposal. We expect in another year to bring in a special report on this subject. We are also making a detailed investigation of all waterworks plants, not only as regards the sanitary and mechanical qualities of the water, but are going into the cost of operation and the keeping of records with the view to reducing this cost.

All water and sewage purification plants are kept under observation and tested at intervals, and all new work in water or sewerage is inspected at frequent intervals during construction to insure that it is being put in in accordance with the plans approved by the State Board of Health.

In the prevention of communicable diseases we must, of course, depend mainly upon our local boards of health. We have our diagnostic laboratory work for typhoid, diphtheria, tuberculosis and rabies. We examine many wells and other sources of water supply suspected to be the cause of typhoid fever. We keep 266 stations supplied with diphtheria antitoxin which is furnished free to the indigent and is paid for by the local authorities.

We have about decided to ask our legislature, which meets next January, to give us means to manufacture antitoxin to be supplied free to rich and poor alike. We believe this would materially reduce the number of cases and our death rate from diphtheria.

Our board secured the Act for a State Sanatorium for Tuberculosis, which was formally opened last month, and a supplementary act requiring counties, or groups of from two to five counties, to establish hospitals for advanced cases of that disease.

We have ten smallpox inspectors, used mostly in diagnostic work. We have framed a bill to enable us to appoint twelve district medical inspectors to be used mainly in the prevention of communicable diseases.

One feature of this bill I will speak of briefly. Under its provisions an inspector may go into any community where a dangerous communicable disease has appeared, and if the local authorities refuse or fail to promptly enforce proper restrictive measures he may assume charge, appoint deputies and create any necessary expense. This must be paid by the local authorities and the Attorney-General may sue and collect the amount from the community that failed to act.

The educational work in regard to the prevention of communicable diseases by the usual means of circulars, bulletins, lectures, etc., has not been neglected.

Only one other feature of our work will be mentioned for fear of becoming tedious. In 1886 there were not more than 25 or 30 local boards of health in the State.

It was simply permissive with councils of cities and villages to establish such boards. No provision was made for the rural districts. Through legislation secured by the State Board of Health we now have 2,124 boards of health or health officers acting in lieu of a board of health.

Politics, and lack of public interest in, or appreciation of the importance of, the work of local health officers has been and still is our greatest handicap to effective health work. Except in our large cities the salaries paid to health officers are still ridiculously inadequate.

It is a discouraging fact that those charged with the two most important functions of the State—the education of the child and the protection of the public health—are its poorest paid servants. Had it not been that health work has been largely a labor of love, and that thousands of medical men have given their best efforts to protect the public against needless disease without thought of compensation, health conditions in Ohio, as in all the other states, would be vastly worse to-day than they are.

There is evidence of a coming change in these conditions. An eminent sociological worker from your State, at the recent meeting of the American Public Health Association, ventured the prediction that in ten years the health department would be generally regarded as the most important division of municipal government. Our advanced thinkers are beginning to realize

the close relation of insanitary conditions and the resulting ill health and premature death of wage-earners, to poverty, vice and crime. They are beginning to see, too, what immense sums preventable sickness is costing the city, the State and the Nation. The economist, and so-called "social engineer," the man who is studying civic conditions with the view to their betterment, are coming to our aid. A private individual has just given a million of dollars to eradicate hookworm disease. The day is surely coming, and is not far away, when the people everywhere will recognize that their most precious interests are in the hands of their health officer, and will gladly give him the credit and reward which are already his due.

Let us then push on with courage, constantly striving, as we are to-day, to better prepare ourselves for the great things that still remain to be done.

COMMISSIONER PORTER — We have all listened with great pleasure to this paper. Is there any discussion of it?

I judge from what the doctor says, that the remuneration of the health officer in Ohio does not materially exceed that paid his brother in New York. I hope soon the competition will be not to see how little they can pay a health officer, but how nearly they can come to paying what he is worth.

The next paper on our program is by a gentleman whose facilities and felicity in dealing with statistics we are somewhat familiar with. In his hands the dry columns of figures adorning a statistical page become animated, brilliant, full of life, and the paper by Dr. Hoffman on Statistics reads like one of Dumas' romances. It gives me great pleasure to introduce Dr. Frederick L. Hoffman.

INFLUENCE OF TRADES ON DISEASE

BY FREDERICK L. HOFFMAN

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Industrial hygiene has for its object the physical well-being of working people, and its sphere is practically all-inclusive of what is comprehended in the industrial system. It is only within very recent years that the vast importance of this branch of preventive medicine has been clearly recognized by the medical profession as a practical problem, but the public interest in the subject has been less active in the United States than in England, France, Germany and other countries. In part this backward condition is the result of the rather exceptional and more favorable social condition of American labor, necessitating a lesser degree of drastic state interference than has been found necessary in the older countries of the world. Most of our factories and workshops are of comparatively recent construction and they have, as a rule, been built with a fair regard to modern standards of light, air and ventilation. As the result of the concentration of industry, many of the older factories have gone out of use or have been rebuilt in harmony with more modern requirements. The better wages, the shorter hours, and the higher standard of living of American labor have also very largely contributed to bring about a better physical condition of wage-earners than is met with in European countries.

It is a readily observed fact of general experience that however intimate the connection of occupational activity may be with the resulting injury to health and life, the problem is enormously complicated by other causes and conditions affecting the general physical well-being of the people. Where wages are comparatively high better food can be furnished, better housing can be secured, more rest and recreation can be had, and in the event of illness better medical attendance is possible, than where the opposite economic conditions prevail. Hence the injurious effects of certain industrial conditions are less serious among a people econo-

mically in a superior position than among wage-earners who work for lower wages, longer hours, and under conditions of life otherwise of an inferior order.

Considerations like these explain in part why industrial hygiene should not have attracted the same widespread interest of the medical profession of the United States which it has attracted in European and other countries, but there can be no question of doubt that, broadly speaking, the conditions of industry inimical to wage-earners' health never have been, and are not now, as serious in the United States as in the older countries of Europe. This favorable position is, however, only comparative, and the conditions in many occupations are far from satisfactory in this country.

The increasing proportion of population engaged in industry also emphasizes the growing importance of this subject. Even during the short period of five years ending with 1905 the proportion of persons employed in manufacturing establishments has increased 16 per cent. But the sphere of industrial hygiene is not limited to manufacturing industries; it includes every employment followed by men, women and children from the earliest years of life to its very close. It includes persons of every degree of physical condition from those in perfect physical health to the physically impaired, defective and deformed. Many occupations which can be followed without injury to health and life by the physically sound cannot be followed without detrimental results by the physically weak, by women or children, or by the aged.

With rare exceptions occupation selection proceeds without a proper regard to physical ability to perform the duties required and in many employments there are persons wholly unsuited to the mechanical tasks which they are required to perform. In the case of women and children this law of physical adaptability receives recognition in modern laws regulating the employment, but even in this respect there is still a vast amount of maladjustment. It would not seem to require an extended argument to prove that small children are wholly unsuited to certain kinds of physical activity and that under no circumstances should such children be exposed to the continuous and considerable inhalation of industrial dust. It would also seem to require no argument to

prove that women must not be employed at work which is beyond their physical strength, or at night, or underground, but only during recent years has legal sanction been given to humanitarian considerations which forbid the employment of women and children in unsuitable pursuits. The fact, however, cannot be gainsaid that the proportion of women in industry is rapidly increasing and that they follow a large number of employments to which, because of their sex, they are not properly adapted, and which, therefore, require statutory regulation, at least as to hours of labor, and the statutory prohibition of night work and work underground.

The United States, in the social condition of its women and children, is immeasurably in advance of European countries, where of bitter necessity they are often employed at arduous or unhealthful occupations at which they have rarely, or never, been employed in this country. Women, with us, have never been employed in mines, at heavy work in potteries, at unloading of vessels, or similar unsuitable tasks. Our respect for women revolts at the thought of even the remote possibility that they may perform heavy manual work as a necessary consequence of an independent struggle for existence. Children have been exploited to a very considerable extent in all countries, but happily indeed, the modern conscience is awakening to social responsibility in this matter and a recognition of the incontrovertible truth that the children are, in fact, the most valuable asset of a nation. At the same time, in the case of both women and children the economic condition of the nation is not such that they can be entirely relieved from their respective share in participating in the industrial processes by which the life of the community is carried on, and even the wealthiest of nations in modern times cannot relieve a large proportion of its women and children from the necessity of active work at tasks suitable to their sex and strength.

The conservation of health and strength is a national problem of far-reaching importance and particularly so in the case of industrial nations which are actively engaged in the struggle for international commercial supremacy. Industrial efficiency is fostered and advanced by the best possible conditions suitable to health and life, and by a most rigid obedience to the principles

of rational industrial hygiene. Every adult male worker represents a valuable national asset which cannot be destroyed without more or less serious injury to the national economy. A considerable amount of capital has been sunk in the production of factory workers or wage-earners of all kinds, partly by parental care, partly by State solicitude in the form of education and otherwise, so that at the age of commencing work a life, broadly speaking, has its highest potential economic value, because so much money, effort and care has been sunk in its production and nothing as yet has been returned. For the State to realize a proper return on the human investment, every year of subsequent lifetime is of the greatest possible economic importance, and to industry itself that value increases in exact proportion to the labor experience gained. Nothing can be more shallow or intrinsically absurd than the argument that one man is as good as another, or that a life lost can easily be replaced, for under modern conditions resulting from the minute subdivision of labor, the average workman of mature years is decidedly superior to a new man who requires, first, to be trained that he may be adapted to his work.

Aside from this purely economic consideration there are, of course, ethical and humanitarian considerations which demand that the most that the State can do shall be done to secure to wage earners not only equality of opportunity, but also the best possible conditions favorable to sound health and long life. Whatever may be said with regard to the reckless and needless waste of our natural resources applies with more than double force to the criminal and inhuman waste of our human resources as is made evident in a high adult death rate from industrial diseases, and in particular from a high mortality from consumption in dusty trades, and the frequency of lead or other mineral poisoning among persons in certain occupations, or finally, in the lamentable and disgraceful frequency of industrial accidents. The waste of these lives imposes a tremendous burden upon the nation which, though unseen and not calculable in dollars and cents, is nevertheless a very material hindrance to our real progress toward the ideal of a really happy, prosperous and intelligent nation. The sorrow which is brought into thousands of homes as the result of the bread-winner's premature death and the dependence of women

and children as the result of impaired efficiency and premature incapacity for work, is so great a burden upon the nation that if it could be even approximately calculated it would stagger the dullest imagination and call for an aroused conscience of mankind to demand a change.

It is, therefore, not without economic and ethical justification that all modern civilized nations have deliberately undertaken the improvement of the conditions under which industrial activity is carried on and the gradual but certain removal of conditions decidedly inimical to the health of the working people. Since the effects of most of these conditions are generally slow in their operation and most insidious in the manner in which health and strength are gradually undermined, the human machine in its imperfect working is neglected, while the mechanical machine receives abundant care and is further perfected in minute detail with remarkable ingenuity. But the wear and tear on the human machine is much more pronounced and serious than in the case of the mechanical machine, since the former is a vastly more complicated and delicate organism than the latter. In the former the parts or the organs which are worn out or injured cannot be taken out or replaced by new organs or parts, as is the case in the mechanical machine, but they are lost forever and human life is correspondingly shortened and terminated at an age often many years before its natural or normal end.

There can be no doubt, however, that mortality has diminished and that there has been a decrease in morbidity, but both mortality and morbidity, among certain classes of wage-earners, are still decidedly above the average, and of no disease is this more true than of consumption. Every trade in which there is exposure to the continuous and considerable inhalation of dust should be made a matter of government concern, so that the factors and conditions inimical to health and life may be reduced to a minimum. At present this is not the case in hardly a single one of the numerous employments in which the death rate from tubercular or respiratory diseases is above the average, and only a beginning has been made in calling public attention to the facts. Small hope can be held out for success in the humane effort to diminish the ravages of tubercular diseases until the evil is attacked in its origin, and pre-

ventitive measures are generally adopted to effectively protect the health of women and children in industrial pursuits. Only a few illustrations are necessary to emphasize the impressive and far-reaching truth of this assertion.

Among men employed in occupations with exposure to metallic dust, at ages 15-24 the proportion of deaths from consumption is 46.5 per cent., at ages 25-34 it is 57.2 per cent., at ages 35-44 it is 42.4 per cent., and at ages 45-54 it is 23.4 per cent. Somewhat similar, though not quite so serious, are the facts regarding men employed in occupations with exposure to mineral dust, which at ages 15-24 causes a mortality from consumption of 31.7 per cent., at ages 25-34 of 47.6 per cent., at 35-44 of 36.3 per cent., and at ages 45-54 of 27.9 per cent. The facts for certain specific occupations are still more serious and alarming. Considering only grinders, the proportion of deaths from consumption at ages 25-34 is 70.8 per cent, against 31.3 per cent. for men in all occupations. That percentage itself is decidedly too high, the excess resulting naturally from the large proportion of persons employed in occupations with a mortality from consumption above the average. Thus among farmers and planters, according to the census mortality statistics for 1908, the percentage of deaths from consumption at ages 25-34 years was only 25.6 per cent. against 35.9 per cent. for draymen and hackmen, 41.2 per cent. for tailors, 42.9 per cent. for plumbers, and 49.2 per cent. for compositors, printers and pressmen.

Facts like these, which cannot be gainsaid, and which are incontrovertible since they are sustained by every qualified investigation into the vital statistics of different trades, emphasize the duty of government and private enterprises to leave nothing undone to reduce the disease liability to the minimum. In particular, however, do these facts emphasize the duty of the medical profession to specialize in the field of industrial medicine and to follow European examples by perfecting the study of disease predisposition in recognized unhealthful trades. While much can be done by preventive medicine there must always remain a large field for the specialist in occupational diseases who shall select for his field recognized unhealthful trades or recognized ill-health pro-

ducing factors seriously affecting the different parts of the human organism to the decided detriment of the body as a whole.

As yet this field is practically neglected in the United States. No qualified and comprehensive treatise on occupational diseases has been written by an American authority, and the fragmentary contributions only emphasize the deplorable neglect of one of the most promising fields in modern medicine. The really valuable literature on occupational diseases is almost entirely foreign, and foremost among the works in English which are deserving of painstaking study are the contributions by the late Dr. Arlidge and the more recent works by Sir Thomas Oliver. While these two writers have taken the whole domain of industrial medicine for their respective fields, there is a numerous body of faithful workers who have specialized in particular fields. I may mention among others the researches with regard to arsenic, by Dr. Malcolm Morris; the effect of employment in ganister crushing, by Hamilton P. Smith; the effect of steel grinding by Sinclair White; the dangers in the use of mercury and its salts, by Dr. T. M. Legge; the effects of employment in the manufacture and handling of copper and brass, by Dr. R. M. Simon; the disease liability in the manufacture of high explosives, by Dr. R. P. White; the dangers of employment in chemical trades, by A. P. Laurie, M. A.; the dangers of working in jute, by Harry J. Wilson; the employment in laundries, by Lucy A. E. Deane; the danger of flax and linen manufacture, by Dr. Purdon; the hygiene of cotton manufacture, by James Wheatley; and many similar researches, most of which have been brought together in a single volume under the title "Dangerous Trades," by Sir Thomas Oliver, who himself has contributed many valuable special articles, in particular on the disease liability in match manufacture, and the dangers of working in lead and its various compounds.

Even more numerous and valuable are the contributions by German authorities on occupational mortality, largely resulting from the duty imposed upon German industry by the government insurance system. The most authoritative treatise on the subject is a handbook on the diseases of workingmen, edited by Dr. Theodore Weyl, who himself has made many and highly specialized inquiries into particular trade diseases. In this work the

diseases of miners are discussed by Dr. Lindermann, the diseases of workingmen in lead, silver, zinc and quicksilver, by Dr. Laureck; the diseases of workers in iron by Dr. Roepke; the diseases of metal workers, by Dr. Zadek; the diseases of chemical workers, by Dr. Weyl; the diseases of rubber workers, by the same author; the diseases of gas workers, by Dr. Schuette; the diseases of silverworkers by Dr. Silberstein; the diseases of potters, by Dr. Holitscher; and many others too numerous to be included in this summary.

These are but a few fragmentary references to the vast literature of occupational diseases, which includes but a very few American writers of recognized authority. The most valuable American contribution, partly antiquated but still of considerable value, having been printed in 1895, in *The Twentieth Century Practice of Medicine*, is the contribution by Dr. James Hendrie Lloyd, of Philadelphia, who emphasizes in particular the importance of industrial poisonings, but he includes observations on the effects of dust, tobacco, compressed air, bad sanitation and ventilation, etc. Of course there are others, but their writings are chiefly compilations of foreign data and only a beginning has been made in original research.

I mention these few to indicate the importance of the subject and to emphasize the vast, though as yet hardly recognized, possibilities of qualified research in the field of industrial medicine in the United States. In exact proportion as the evil becomes recognized will remedial measures be demanded and the recognition of the evil and its relation to the community at large must necessarily come through the medical profession, qualified to establish the facts with at least approximate accuracy for the practical needs of the present time.

The first step in the direction of a deliberate and rational policy of industrial hygiene is the appointment of qualified medical factory inspectors in conformity to the English and continental practice of the present day. Only by qualified medical supervision of factories can the conditions productive of diseases be brought to light and can remedial measures be proposed, which in the end will do away with conditions decidedly and unquestionably detrimental to the health and life of wage-earners at the

present time. Only through such supervision can the experience be gained, which in its nature must extend over many years to trace with unerring accuracy the true incidence of disease-causing conditions, which are, as a rule, extremely slow in their effects on the human organism and which ordinarily escape attention. The facts of most importance are, therefore, rarely made a matter of official record. Only by such medical supervision will death certification be gradually improved so that the actual occupation of the deceased, as well as the true cause of death, shall be recorded, and if the facts warrant it, be brought to public attention. Under the present method of death certification there is no question of doubt that some of the most important facts bearing upon problems of industrial hygiene are not made a matter of official record, since in the classification of deaths preference is of necessity given to the immediate rather than to the remote cause of death. This, for illustration, explains why we have so few recorded deaths from fibroid phthisis, which is a true occupational disease, or from lead poisoning, which is often the remote cause of deaths recorded as due to kidney, liver and other diseases.

Medical supervision of factories would be productive of substantial good in other and even more important directions in that qualified medical advice would suggest remedial measures for the improvement of ventilation, the securing of better light and air conditions, the effective removal of industrial dust, and the mitigation of evils arising out of the presence of noxious fumes, vapors, etc. All these matters are extremely complex in their inter-relation and they involve perplexing problems to the employer as well as to the State. Manifestly State interference with industry must proceed upon extremely cautious lines so that the industrial activity itself is not seriously hindered, since its abrogation would be an even greater calamity than premature disease and death to some of the workers themselves. At the same time, however, in the light of a vast experience the truth cannot be denied that very considerable improvements are possible without much cost or hindrance to industry itself. In fact, most of the evidence which is available proves conclusively that the benefits resulting to various industries from the improvement of the health of employees by the introduction of methods or conditions under which

such industries are carried on, have far more than repaid the original expense of installation by the larger unit product of the persons employed. While this conclusion cannot always be substantiated it is nevertheless a valid inference that workmen in the best of health must be better producers than those in inferior health, of weak constitution, and diminished physical strength. This is so self-evident a conclusion that it requires not to be sustained by statements or other proof.

It would carry me entirely too far to discuss all the elements of the problem, but I at least may enumerate the most important. Among the detrimental conditions of industry which require medical supervision and medical inquiry are the effects of excessive labor, chiefly on the part of women and children, and of young persons apprenticed to employments possibly beyond their physical strength. The principle has been established for at least some employments that a medical examination must determine the fitness for the occupation to be followed, and this principle in time may be extended to all employments, including re-examination from time to time to determine whether the employment has been followed by injurious consequences sufficiently serious to demand a radical change.

The time may come, and I trust that it will come, when workmen will voluntarily submit to such re-examination on the part of such qualified experts in industrial medicine, so that a word of caution at the proper time may be the means of saving valuable years of life for the benefit of the individual and the community as a whole. Such an examination or re-examination would suggest the importance of a change of occupation in many cases where men now follow one particularly unhealthful trade for most of the years of their active lifetime. It may come about that men will realize that the more dangerous employments should not be followed by any one for a lifetime, or at least not successively for any considerable length of time. Employments which are serious in their consequence only when continuously followed for a long time may be found to be comparatively harmless when followed for only comparatively short periods. It should be found practicable in such employments to shift the employees from the most dangerous to the least dangerous, and *vice versa*, to reduce the

evil effects of exposure to industrial dust or to industrial poisons to the minimum. If an effective method of medical supervision of factory conditions and the health of factory workers produced no results other than these, the system would fully justify itself.

Other detrimental conditions to health in industry include physical and mental overstrain, excessively repeated muscular action, and bodily fatigue, which is made manifest in the higher degree of accident frequency in the afternoon than during the morning hours of work. Overstrain, or overlifting of heavy burdens, is not done away with even where machinery is extensively used and cases of hernia are still distressingly frequent, but the extent of internal injury is not a matter of official record. Among boiler makers and riveters, as the result of the general use of automatic riveting machines, we meet with serious consequences resulting from the effects of concussion of the air, but the actual extent to which workmen of this class are affected is not at present a matter of record. The modern development of tunnel and underground construction has largely increased the number of workmen exposed to the dangers of compressed air, corresponding in part to the well-known risks attending the occupation of divers, who as much as any class of men are exposed to conditions detrimental to health. These are but brief illustrations of the dangers which surround the modern workman and which have resulted in quite different disease and accident risks in industry from the corresponding risks and conditions of an earlier date. Over most of these conditions the workman himself has but a very slight degree of actual control, and while a decided improvement is possible by the intelligent co-operation of master and workman, the fact remains that the consequences to health and life fall upon the employee alone.

Every occupation, however, furnishes a field of profitable medical inquiry, for the ramifications of modern industry and the manner in which industrial operations react upon the health and lifetime of the workman are practically endless. Of no employments is this probably more true than of the large group of workers exposed to gases, vapors, high temperatures, etc. While much has been written regarding the liability of underground miners to accidents from explosion, very little indeed is known with ac-

curacy regarding the health-injurious consequences of underground work, including the serious effects of coal dust inhalation and of gases and noxious vapors of all kinds met with in the different branches of coal and metal mining. Practically nothing is known with accuracy regarding the health-injurious consequences of employment in the numerous chemical trades, and our present information is limited almost entirely to English, German and other continental sources. The subject, however, is certain to attract more attention in the future, with the increasing development of the mining, smelting and chemical industries in the United States.

The effect of metallic poisons, dusts and fumes is another large subject of inquiry, where more progress has been made, chiefly because of the frequency of lead poisoning in potteries, white lead works, smelters, etc. While the disastrous effects of smelter fumes on the surrounding vegetation are well known and have led to much costly litigation and drastic State interference with industry, the corresponding effects on the human organism of fumes and vapors generated during the different kinds of smelting processes are but at best imperfectly understood. The actual degree of frequency of lead poisoning in the manufacture of pottery, cut-glass, etc., is not a matter of official record, but it is in every way desirable that the United States should follow the example of England and the continental nations, and to require notification of all cases of industrial poisoning, at least of those occurring in large establishments. It is even more difficult to trace the frequency of lead poisoning in the case of painters, who, as a rule, follow individual pursuits, but there can be no question of doubt that the insidious effects of such poisoning are much more common among painters, typefounders, and others exposed to its dangers, than is generally assumed. Among similar occupations with exposure to metallic poisoning mention may be made of brass founders, who suffer from a distinct occupational disease known as "brass founders' ague," but the frequency of this malady in this country is unknown.

In all of these occupations there is the imperative necessity of personal cleanliness on the part of the workmen, and of well ventilated workshops, with adequate facilities for the escape of fumes and the effective removal of industrial dust. As pointed out by Sir Thomas Oliver, in all such employments hot and cold water

should be provided for the men to wash in, and the workshops themselves should be thoroughly cleaned at least once a year. The workmen should be provided with milk as a prophylactic as well as curative agent against the various kinds of industrial poisoning to which they are continually exposed. The use of respirators may no doubt very often be inconvenient, but it should nevertheless be insisted upon as perhaps the most effective safeguard against the inhalation of noxious vapors, fumes, gases, and injurious dust.

The very complexity of the subject precludes its adequate consideration by the layman, but the mere outline of general industrial conditions injurious to health and life re-emphasizes the necessity of medical supervision of factories and the medical examination and re-examination of workmen employed in dangerous pursuits. Every trade from the indoor or sedentary occupations to the outdoor life of the farmer and the hunter's guide presents peculiar occupational dangers which have their medical as well as social aspect, demanding the practical interest of all who are interested in the well-being of their fellowmen. Any single occupation selected for the purpose of illustration would perhaps more clearly bring out the salient factors which demand consideration, but no occupation presents dangers and conditions which are exactly typical of the whole. Perhaps the most serious consequence to health in industry is industrial dust, and if anywhere State interference is warranted it is in the intelligent regulation of industrial processes giving rise to dust inimical to health.

Every trade, however, requires separate and distinct consideration, and accordingly the rules and regulations adopted by foreign governments for industrial disease prevention vary, since they arise out of the conditions themselves under which industry is carried on. The elaborate rules adopted by German industrial accident associations for the prevention of injuries, and the corresponding rules adopted by sickness associations for the prevention of industrial diseases, are deserving of careful study as perhaps the most effective measures designed to protect the health of men and women employed in industry. The corresponding Home Office regulations of the British Government include numerous injurious occupations such as bichromate works, brass mixing and casting, chemical works, earthenware and china manufacture, enameling of

iron plates, electrical accumulator works, explosive works in which dinitro-benzol is used, flax spinning and weaving, red, white and yellow lead works, lead smelting works, lucifer match factories, paint and color works, extraction of arsenic, skin and hide sorting, tinning and enameling of iron ware, vulcanizing of India rubber, wool sorting and combing, etc. The German regulations include sugar refineries, cigar factories, brush-making works and horse-hair spinning, letter press writing, basic slag works, wire-drawing mills, etc.

All of these regulations are based upon painstaking inquiry into the actual conditions under which industry is carried on and they have been carefully designed to cause the least possible interference with necessary industrial processes and at minimum expense. They are the result of a humane policy of labor protection but they also have minimized employers' liability for workmen's compensation on account of industrial diseases. While under the English law of 1906 the term "industrial disease" has as yet a very limited significance, it is certain to be enlarged in the course of time under the authority given to the Secretary of State to bring diseases clearly the result of industrial activity within the meaning of the act.

The progress which has been made in this policy of labor protection will not stop at its present stage, but will continue until every detail has been perfected and every industry brought within the scope of effective factory supervision and control. The annual reports of the factory inspectors of the United Kingdom are models of their kind, to which we have nothing to correspond in the United States at the present time. The medical inspection reports on industrial conditions and the elaborate inquiries which have been made under medical supervision into industrial processes injurious to health are of such a self-evident, practical value that corresponding methods of inquiry, in course of time, are bound to be adopted over here. Our system of factory inspection has no doubt been productive of much good, but only a small beginning has been made in securing the best possible results. Not until factory inspection is made partly a medical function, and not until factory workers engaged in decidedly health-injurious employments are subject to medical supervision, will there be a decided improve-

ment in the health of our workingmen, which is as much a State duty as the protection of women and children in industrial pursuits.

It is no doubt a difficult task to establish positively and clearly the direct causes of ill-health in industry, and of premature invalidity or incapacity to work, but the evidence is entirely sufficient to warrant the conclusion that to a large extent the health of our wage-earners is undermined by working conditions which are subject to a material improvement. We know, as a matter of fact, that the most important causes of invalidity, or incapacity to work, or in other words, of physical impairment, are tuberculosis of the lungs, and the large group of respiratory diseases which, among others, shorten the lives of potters, glassworkers, stonecutters, etc. We know that next to these a most important factor is muscular rheumatism, followed by diseases of the heart and the circulatory system. We know that in many industrial processes eye-strain is a serious factor, impairing not only the visual function but causing nervous, digestive and other serious bodily disturbances as the result of occupational activities. Many employments are also the direct cause of digestive disturbances, chiefly, of course, where metallic poisons in the form of dust, fumes, vapors, etc., are inhaled into the system or introduced into it otherwise by personal uncleanness or indifference, but all such afflictions are the direct consequence of industrial activity, which can be safeguarded against only by stringent rules and the intelligent co-operation of workman and master in the use of all reasonable safety precautions.

The ultimate social and economic value of deliberate and rational measures for the prevention of industrial diseases and the resulting impairment in industrial efficiency and wage-earning capacity, would be enormous. Briefly, by way of illustration, the difference in the mortality rate of workmen employed under comparatively healthful conditions and of men exposed to unhealthful conditions, are sufficient to account for not less than one-third of the average adult death rate at the present time. For illustration, at ages 25-34 the death rate of farmers and agricultural laborers, according to English statistics (for there are no corresponding data for the United States) is 3.96 per 1,000, for printers the corresponding rate is 6.46, and for cotton workers it is 5.48; at ages 55-64 the death rate for farmers and agricultural laborers is 20.25, for

printers 30.76, and for cotton workers 41.15. These illustrations can be multiplied in the case of a large number of more or less unhealthful trades, but they sustain the conclusion that the field for industrial hygiene is indeed one of the most promising, in far-reaching consequences, of all the various endeavors at social amelioration of the present time.

What is true of mortality is even more true of sickness, but unfortunately our data are less satisfactory and the true facts can only be determined by a qualified and thorough inquiry into the whole subject of industrial diseases. According to German statistics, at ages 20-29 out of every 100 male wage-earners 29 were incapacitated on account of sickness during the course of a single year; at ages 30-39 the rate was 35 per cent., increasing to 40 per cent. at ages 40-49, and to 48 per cent. at ages 50-59. For wage-earning women the sickness rates were 31 per cent. at ages 20-29, 36 per cent. at ages 30-39, 33 per cent. at ages 40-49, and 40 per cent. at ages 50-59. Naturally, on account of the larger number at work the data for male wage-earners are more conclusive.

For Austria, corresponding data show that the percentage of sickness was 42.3 at ages 15-20, 43.6 at 21-30, 47.4 at 31-40, 52.6 at 41-50, and 58.8 at 51-60. The range of sickness; however, for the different occupations varied from the comparative sickness figure of 46 in the case of clerks, and 56 in the case of tailors, to 170 in the case of men employed in chemical works, and 183 in the case of men employed in smelting and reduction works. Among women the most unhealthful occupations were employment in the manufacture of matches, clay and pottery works, and tobacco works.

The duty of government in the vast field of industrial hygiene is, therefore, no longer an academic question but a problem in practical politics of the greatest possible importance. Wage-earners are rightfully entitled to the best possible conditions under which productive industry can be carried on, and this comprehends the voluntary or compulsory introduction of all reasonable methods and means by which the conditions inimical to life and health in industry can be reduced to the minimum. Factory legislation, to be thoroughly effective, must, however, be based upon a thor-

ough knowledge of the actual conditions under which industry is carried on, while every protective measure must be framed to enlist the hearty co-operation of employees to make the same thoroughly effective. To be productive of the best results all factory legislation which has for its object the conservation of health and life in industry must be based upon sound medical considerations to bring the particular provisions of the law into harmony with the most advanced and thoroughly qualified medical judgment of the day. Other governments throughout the world have utilized expert medical opinion in matters of this kind, and it is of the utmost importance that all future labor legislation bearing upon questions of health and life in this country should also be based upon thoroughly qualified medical opinion.

Medicine as a healing art is no longer the sole function of the medical profession, but the vast domain of preventive medicine offers immense opportunities for useful and remunerative work to medical men of ability who may specialize in this field of useful research and beneficent employment. In this direction there lies the most promising future for the medical specialist trained in the science and art of industrial hygiene. Whatever contributes to the raising of the physical well-being of the race is not only a humane duty but the most practical aid toward the ideal of attaining the highest degree of individual and social efficiency on the part of the millions of toiling men and women who make up the best and the most that constitutes the mass of mankind.

COMMISSIONER PORTER—This very earnest and impressive paper by Mr. Hoffman may well serve to stimulate our interest in this important subject, and cause us to give it that consideration which matters of importance demand. The discussion on this paper will be started by Dr. Charles C. Duryee, of Schenectady.

DR. CHARLES C. DURYEE—I have been intensely interested in this paper. I wish it might be that a copy of it might be in the hands of every employer and every man who earns his bread by the sweat of his brow. It is a subject which has been brought to the attention of many health officers in the last few years. It happens that in the city from which I come, that some attention has been paid to these very things. They have not been forced by law, or by the health officer, but they have been the contributions of the managers of those works, which are located there. The General Electric Company which employs 16,000 or 17,000 men—think of massing such a number of men in one plant—has done everything and is now doing it, so that an American workman may have fair, hygienic conditions under which to labor. They have started with dust machines, and if you go to the works of the General Electric Company, you will see the best application of the

principle of dust extraction which you can find anywhere. They deal, among other things, in porcelain, and the inhalation of dust from these objects is something exceedingly great, and it is very hard on their workmen, and you should see the machine they have installed, to take this porcelain dust out of the air. Their toilet accommodations are the very best. They have individual wash basins for every man in the house. Each man has his own wash basin, soap and towel.

There are a number of other things which show you that these managers recognize that if they are to keep good men, they must make proper conditions for them.

I said one year ago to the manager, "This has cost you a great deal of money." He said, "Yes; but it is a good investment."

I believe if such a paper as this were put in the hands of men who control men, in the hands of legislators, we would get up a campaign of education on that line, the results of which would be as great as those in the campaign of tuberculosis. I believe, Dr. Porter, this is one of the most valuable papers I have been privileged to hear.

DR. PORTER — We will now hear from Dr. C. H. Glidden, of Little Falls.

DR. C. H. GLIDDEN — It has been a great pleasure, I am sure, to all of us to listen to these papers, and I felt when Mr. Hoffman sat down, that we were in the position of the gentleman from Ohio, that it would be easier to say what we had not done than to say what we had done. However, it was my privilege to be a student in this city, in the office of an old gentleman, Dr. Edward M. Lowell; and while I was there, he was appointed a member of the first State Board of Health. So I have witnessed the evolution of reforms so far instituted in this State. I can assure Mr. Hoffman that we are trying to do something to reform the very conditions he speaks of.

In the little city in which I live, within the past two years, two large factories have been erected, and the sanitary condition of those factories is excellent. I mean comparatively so. Of course, I do not mean to say there is no room for improvement. But in place of the factories such as we had at Little Falls, surrounded by heaps of old rubbish, ashes, lumber, and so forth, they are a very distinct and decided improvement. Instead of those we now see lawns and flower beds and everything attractive to the eyes. Inside we see pretty fair, only fair, sanitary conditions. Much yet is needed in that respect. But I was pleased to hear Dr. Duryee talk of the efforts and the work of the General Electric Company at Schenectady. I know whereof I speak when I refer to the conditions at Little Falls, as I have been particularly interested in the bureau of health at Little Falls. The new factories are pretty good.

But, as Commissioner Porter said: It is purely a question of education. The health officer is powerless to get above public sentiment. When the people demand it, we will get sanitary reforms; and until they demand it, we must do the best we can.

I want to emphasize the fact that as health officers we are powerless to enforce sanitary conditions beyond what the people demand. The Health Department is doing a great deal to help us.

COMMISSIONER PORTER — Dr. Rogers, of the Department of Labor, will now discuss the paper.

DR. GRAHAM ROGERS — Mr. Hoffman published an exhaustive treatment for the Federal Government regarding dust.

I believe we should look to home conditions and give credit at home where credit is due; and that we need not go abroad for statistics. For two years the New York State Labor Department has had a medical inspector of factories. Last year, the Commissioner of Labor, in his annual report to the Legislature, presented a report of the medical inspection of factories, with some elaborate tables of carbon dioxide obtained in factories, and so forth. Those tables upset many theories and plans advanced by sanitary engineers. The result is considerable work has been done among the factories in the State of New York along the line of ventilation which is probably one of the best lines to overcome that.

There have been sections of law to cover dust-creating machinery, and the Department of Labor requires the removal of dust by exhausting fans.

In Massachusetts there are fifteen inspectors. The work is complex, and those inspectors have taken up conditions in the factories and published reports. In the June Bulletin of the State Department of Labor is a report of a special investigation as to the calico print industry of this State, the method and process from the time the muslin goes into the mill until it comes out print goods. And besides, the State Labor Department has been securing for the past two years physical records of children in factories. In Great Britain there is a medical inspector. In Belgium they have a chief medical inspector, with a number of inspectors and a laboratory. In France they have none, but they have health officers. In Germany they have health officers. In Holland, the same.

But we have different conditions here. We cannot go into these places and overhaul things as we might wish. How many of these conditions in factories classified as "deaths from tuberculosis" are not properly traceable to the factory, but to the home and housing conditions of the employees. Those things must be taken into consideration. Do not place all the blame on the factory owner. I believe in Dr. Hoffman's work, but New York State is doing something; New York State is the first State in this country to do it, and I think the work can compare favorably with the work done in other countries. New York State is not having a band to attract attention, nor is it making any grand-stand play, but it is going ahead, doing steady work. But of course this takes time. The Bulletin of the Department of Labor is published quarterly. We have no authorities here in this country, but that is because no one has been taught. But eventually we will arrive at morbidity statistics. We do not want mortality statistics, but morbidity statistics. If the industry is the cause of disease, then it is easy to get at the disease. Let us have preventive medicine, and that can only come through proper statistics.

It has been my plea for two or three years to teach industrial hygiene, and have medical officers teach it, and try to get the best results from it.

COMMISSIONER PORTER—In conclusion, my friends, it seems to me that enthusiasm in a good cause is a good thing and I trust it may never grow less: but we must have statistics to show the results of prevailing conditions. You can take insanity, pauperism, crime, and avoidable and unavoidable accidents; and when you come to the final summing up, you can charge it to the medical profession; and not one of us can stand before the bar and plead "Not guilty"; and yet that indictment is subject to a reasonable argument before the verdict is given.

It is well that Mr. Hoffman presents an earnest paper on this subject, where sanitation is so particularly needed, and where good work would undoubtedly be done. Something which most of us have already considered, and which the departments of the State, represented here to-day, have already taken up; and yet it remains true that these other matters can be charged against us as this subject which Mr. Hoffman has brought out. It is well it was brought out at this Conference, and it arouses us to work, and it revives the belief that not only the reform Mr. Hoffman demands at our hand shall become practical, but other matters which seem Utopian to-day will be the practice to-morrow.

Gentlemen, I think we have had a very auspicious opening to our Ninth Annual Conference. This evening, we will have the president of Rochester University with us, and Dr. Sedgwick, our good friend from Massachusetts, who will have an important and interesting address, and I hope you will all be here at 8 o'clock sharp this evening.

We will now adjourn until 8 o'clock this evening.

WEDNESDAY, NOVEMBER 10, 1909

SECOND SESSION, 8 P.M.

Public Meeting

Presiding: Hon. JOSEPH T. ALLING

MR. ALLING — Ladies and Gentlemen, it is my pleasant task to-night to call this meeting to order and to preside over its deliberations, and to introduce the speakers. I am asked to do this as the representative of a body of ladies and gentlemen in this city who are helping in the fight for public health.

We are more than glad to welcome to the city you who are the health officers of the State, because your coming adds not only to the fund of knowledge that comes from deliberation and comparison of ideas, but it adds to the education of this community, which is fortunate enough to have in its midst these meetings.

It is a most significant fact that the way in which public interest is growing, not only in the healing of disease, but in the prevention of sickness, and it is along that line that the association of which I have the honor to be president, the Rochester Public Health Association, is striving to extend its work.

Ladies and Gentlemen, most significant is that tendency throughout the profession. It is not limited to the medical profession. We strive to prevent fires now, rather than let them get started and put them out; and we strive to prevent accidents by putting gates around the elevators, rather than healing those who have been injured by falls. The great advance made in the care and prevention of communicable disease have taken that form. The fight now is to ascertain the form of yellow fever's origin, so that we can prevent rather than cure it. For a health officer to occupy himself with trying to kill mosquitos, instead of preventing their growth, is now considered a mistake; and yet those who have followed the matter up found that the destruction of the mosquito was the salvation of the community. Ten years ago this would have been considered ridiculous. But it is for you gentlemen connected with the Health Department of the State, it is to you and not to voluntary associations, it is to you officials who are placed in charge of the health of the communities where you reside, that we must look to for effective work. You have a great and a very important mission. Consider in how many ways you touch the community. It is not merely in the economical waste, by the prevention of disease; but the tragedies which come into lives and into homes which by your zeal and care you may prevent. Think of the saving! The difficulty is to know how many might have died if you had not done your work well. But I think every man who is doing his best in the community to protect the public health has a right to feel that he has kept comfort in many homes where death would have precipitated the breaking up of the home and the introduction of everything that was evil. I am sure then, we, who are not in the official class, but who are interested in the public health, with you who are health officers, are the picked men of your community, and no matter how in other departments political considerations shall prevail, in your department nothing shall prevail but the welfare and the health and the betterment of the community.

But I was not asked to preside for the purpose of making a speech. We had hoped to have with us his Excellency, Governor Hughes, but I have a letter in which he says, "I regret very much that I will be unable to attend the Convention of Health Officers at Rochester. I am overwhelmed with

work, and cannot go to Rochester at that time. With best wishes for the success of the meeting, I am, very sincerely yours, Charles E. Hughes."

We have with us, however, those who can speak with authority on the subjects they have chosen, and the first speaker of the evening is the gentleman holding the position of Health Commissioner of the State of New York, and it is with great pleasure that I introduce to you Dr. Eugene H. Porter, who will speak on the subject of "Public Health Problems."

PUBLIC HEALTH PROBLEMS

BY EUGENE H. PORTER, M.D.

State Commissioner of Health

In a notable discourse recently delivered the Bishop of Michigan most forcibly portrayed some of our national vices and sins.

In keen and searching inquiry he laid bare as with a scalpel, the coarse and crude materialism of our industrial lives, the lowness of our ideals, the increase in material wealth which has too often resulted in human filth. And as he said "when one sees the moral degenerates we are producing in our so-called 'high life' and the hordes of practical savages we are breeding in our slums it looks as if our civilization was becoming like Ephraim in the prophet's figure a cake not 'turned,' burned and blackened with over-indulgence on one side and raw and sodden on the other."

So materialistic are we that we fail to distinguish between bigness and greatness. Bigness is a material quality. It belongs primarily to things. It can be measured by the tape line, bought by the ton or reckoned by figures. Greatness is a spiritual quality. It can neither be measured, weighed nor counted. It is made up of moral and ethical elements.

We commonly speak of New York or Philadelphia or Chicago as great cities. Big cities they undoubtedly are — big in population — in huge buildings — in miles of streets — in vast commercial enterprises. But are they great cities? Ah! the greatness of a city is to be determined by another category of qualities. What is the city doing for its citizens? Has it a live civic consciousness? Is the government wise, honest and efficient?

IS ROCHESTER A GREAT CITY?

Is it by its care of sanitation and the public health, by its parks and playgrounds, its social service, making possible for all its children a clean, wholesome and joyous existence? Is it reducing in any degree the awful waste we see on every side by means of

wise and noble measures for the uplift of the fallen, the care of the deficient, the cure and prevention of moral evils? Is it giving the life of its citizens new meaning, capacity, interest and inspiration? That city alone, said the Bishop, is really great, which greatly serves human life. Mark the definition of the Bishop and note how closely it approaches to the modern conception of sanitary duty. Sanitation is humanitarianism. The motto on the flag is "The welfare of our fellow men." That is about all there is of sanitation, but the proper interpretation of the motto may require some hard thinking.

Sanitary science of to-day is the inevitable result of a most remarkable evolution. As it has developed and its principles have become firmly established it has been more and more clearly perceived that its art and philosophy extended beyond the individual, beyond groups or classes, over all artificial limitations and included in its wide domain all that made for the betterment of humanity. It is concerned with the moral and ethical as well as the material, for the highest and most significant expression of sanitation points directly to the highest plane of living.

The old days and old conceptions of disease and health are passing away. The beliefs, selfish and ignorant, that human beings could be crowded into humble houses destitute of light and air, reeking with filth and swarming with vermin, to die like vermin; that men and women must work more hours each than flesh and blood could bear; that children should be dwarfed and maimed by cruel labor; that the distressed and destitute must protect themselves against not only want but against the fatal diseases caused by man's ignorance, greed and inhumanity; these beliefs are passing away. The old way has cost more lives than all the wars since Alexander, and more gold than has ever been mined. Slowly the lesson has been heeded. We have been led to more general concepts and away from the limitations of earlier prejudices and antagonisms.

In new situations vigor and enthusiasm construct a higher ethics, the practice of which elevates the plane of living. Now this drift of scientific, and to a very appreciable degree, also popular opinion, can mean but one thing. It means that sanitary science has in its process of development become a practical

science and that it is now recognized as such. We have learned that if we allow our neighbor to wallow in filth we must expect to suffer some of the consequences. We have learned, too, that we improve society when we improve its individual members. Every expansion of human intelligence has proved of advantage to society and all the great advantages in the social condition have turned to the profit of humanity.

Fix it firmly in your minds then that sanitation meets with life at every angle. Throughout the tangled web of our civilization the threads of sanitary science run in increasing numbers. No serious problem affecting society, whether it be social, economic or political, can now be considered without reference to the sanitary relationships existing.

In order to show the definiteness and complexity of these relationships I wish to briefly present to you four distinct problems, four separate fields of endeavor, each of high importance, not apparently connected, and yet as we shall see finally bound firmly together in the web of the requirements of an advanced and progressive sanitary science.

The first of these we may term an economic and industrial problem; the second a civic and educational problem; the third a political and social problem and the fourth a medical or experimental research problem. In all of these we shall see how imperative and vital is our interest.

For I conceive that I should utterly fail in this, the high privilege of bearing you a message, should be found wanting in the greater things of our profession, should I fail to attempt to make clear to you the real scope and power of a public health administration.

It is not in the draughting and approval of plans for systems of sewerage and sewage disposal plants, important though these may be; it is not in mere purification of streams and the establishment of filtration plants, necessary as these are; it is not in the routine collection of vital statistics, essential as they are; it is not in the chemical and bacteriological examination of water, milk and sputum, a labor of daily and hourly demand; it is not in these things alone, important and essential as they are, that the real power and scope of any public health administration resides.

It is rather in that clear and illuminating conception of great duties and great opportunities that showing through the shell of routine shines with full radiance on the intricacies of diverse relationships. It is this side of public health administration — that leading from the material to the ethical — from bigness to greatness that I desire to call your attention.

INDUSTRIAL HEALTH

And first I will quote from an able article by my friend Mr. Edwin Björkman in *World's Work* on "What Industrial Civilization May Do to Men."

"Of the fearful conditions under which most of the work is done; of the deafening noise and parching heat in the steel mills; of the stifling steam and scorching doors in the laundry; of the undulating dust that breeds throat and lung troubles in stogie sweat shops and steel mills alike; of the neck-breaking application demanded from the man who tells the exact moment for pouring the metal by the color of the flames above the converter; of the soul slaying routine that requires a girl in the toll-works to repeat the same set of movements 16,000 times in ten hours, I cannot speak in detail here. The worker grows gray at thirty-five and the girl worker never lasts more than six years." During the year ending June 30, 1907, industrial accidents led to the killing of 526 men. Every four hours a man is so seriously injured as to require prolonged hospital treatment; once in twenty-four hours a man is maimed for life; once in twenty-four hours a man is hopelessly disabled and once in every sixteen hours a man is killed. The places where most of these workers, 80,000 in number, live are filthy and indecent beyond belief. It is estimated that the loss of this wanton waste of life is not less than \$5,250,000. To correct these monstrous industrial evils, to abolish these crimes against humanity, the first great power invoked by the writer is the present sincere and efficient health officer of Pittsburgh. That is to say sanitation — the application of the modern practical methods of sanitary science. The second helpful agency appealed to is the united effort of a group of strong, intelligent, public-spirited men educated in sanitary affairs and working with the constituted authorities. In time this effective combination of

forces will radically reform the existing condition. Did you note the title of this paper "What Industrial Civilization May-Do to Men?" In a conversation with the writer before the paper was written, Mr. Björkman said that this and other similar articles were to be contributory to the cause of general sanitation and one of the main objects would be to bring out clearly the economic folly — the huge cost both to the employer and the public of ignoring the plain teachings of sanitary science. It is the first series of papers based on such a postulate ever written. Ten years ago in its practical application it would have been unintelligible to most readers.

The Physical Basis of Citizenship

Some little time ago a boy fourteen years of age from one of the public schools in a large city, was taken to a psychological laboratory for examination. For seven years he had been the despair of his teachers. He was a chronic bad speller. This does not mean he misspelled some words sometimes. He misspelled every word always. His reading was as bad as his spelling and he was absolutely incapable of getting through a single sentence correctly. His case seemed hopeless. The result of the examination was the discovery that the boy had an ocular defect, never in all these years so much as suspected by his teachers or parents; at the distance of about three feet the boy saw everything visible. He lacked the power to direct the two eyes co-ordinately upon the same points in space, the left eye looking a little higher than the right. A page of ordinary print was thus a blur; whenever he attempted to write the words doubled under his pen. Seven years in the schoolroom and nobody had discovered that the boy could not see!

In October, 1907, the New York State Department of Health sent out cards for testing eyes, with instructions for their use, to 446 incorporated villages. Results from 415 schools showed that nearly half the children had optical defects.

The most extensive inquiry yet made in the United States as to the physical condition of school children is that conducted by the Board of Health of New York city since 1905. From March, 1905, to January 1, 1908, 275,641 children have been examined and 198,139, or .709 per cent. have been found to have defects.

Taking these figures as a basis as to eye defects, enlarged tonsils, bad ears and decayed teeth, then the army of children needing attention throughout the United States would be seven out of every ten, or over 14,000,000. Whether these overstate or understate the truth the health and school authorities of the country should find out. The only *new thing* about the physical defects of school children is not their existence but our awakening to their existence, their prevalence, their seriousness if neglected and their cost to individual children, to school progress, to industry and to social welfare.

The best index to community health is the physical welfare of school children. The only index to community conditions prejudicial to health that will make known the child who needs attention is the record of physical examination. The child then as well as the steel worker or the girl drudge has health right. And so the truest index to economic status and standards of living is health environment. The best criterion of opportunity for industrial and political efficiency is the conditions affecting health.

Alcohol and Health

We have noted the definite relationship between sanitation, industrial workers and school children. Let us see what it has to do with another great and perplexing problem. In presenting to you the conclusions I am about to offer I claim absolutely no originality. I have knowledge of their weight and authority and I believe them to be true. I may add that I have given to the matter considerable study with a resultant increase of my conception of its importance.

Alcohol is a definite chemical substance which has certain well defined effects upon man's physical and mental faculties. What are these effects? For twenty years a number of the leading physiologists and psychologists have been working to accumulate accurate knowledge concerning alcohol by direct experimental study. I will try to give briefly the results of these investigations using largely conclusions as given by Professor Rosanoff of Clark University. What is the authority of the evidence? Exactly the same as that of the evidence of investigations in physics or chemistry. It is the *authority* of the experimental method of modern

science. In no sense am I to be considered as either a friend or foe to alcohol. My function is simply to present certain facts which point to inscrutable conditions or results and to make clear the responsibilities and duties of sanitary science in the light of this knowledge.

1. *Alcohol Without Food*

Unlike an ordinary food alcohol when taken in moderate quantity on an empty stomach has two distinct effects on the muscular system — a strengthening one and a weakening one.

During the first brief stage after it is taken, the strengthening effect predominates, the alcohol probably being used as a food by the exhausted body. But no sooner is the first stage over than the weakening effect becomes more prominent, the alcohol probably acting injuriously upon the nervous system.

2. *Alcohol With Food*

Moderate amounts of alcohol taken with a meal effect a very considerable lessening of the capacity for doing muscular work. The widespread notion that moderate drinking with meals helps a laborer to do his work is false.

3. *Alcohol and Working*

Moderate drinking retards to a very considerable degree the activities of life that are intermediate to complexity between purely muscular and physical work. The widespread notion that a drink "braces one up" and makes one do such work faster is false.

4. *Alcohol and the Handicrafts*

Moderate drinking reduces considerably an artisan's efficiency. Its effect is cumulative and the losses caused by it increase as time goes on. The widespread notion that moderate drinking helps an artisan in his daily work is false.

5. *Alcohol and Habitual Association of Ideas*

Moderate daily drinking reduces considerably the rapidity with which habitual associations of ideas are formed in the mind. The

effect of alcohol is cumulative and increases rapidly as time goes on. The notion that alcohol stimulates a person to his mental work is not warranted by facts.

6. *Alcohol and Free Association of Ideas*

Free associations of ideas are affected by moderate daily drinking even more than the simpler habitual associations. The effects of alcohol on free association of ideas is cumulative.

7. *Alcohol and Memory*

Ordinary memorizing is greatly retarded under the influence of moderate daily drinking. This conclusion has been doubly corroborated.

8. *Alcohol and Disease*

Fatty degeneration of the heart, calcification of blood vessels, various forms of fatal liver and kidney diseases, numerous and important nervous diseases, susceptibility to acute infections, decreased resistance to pneumonia and other diseases, and a positive and pronounced ally of tuberculosis.

Investigation further shows that alcohol is responsible for one-fourth of the inmates of our insane asylums, for two-fifths of all abandoned or neglected children, for the presence of half our convicts in our prisons, and of at least an equal number in our workhouses and jails. One-third of all the recognized pauperism and poverty in civilized nations results from bodily and mental inefficiency due to indulgence in alcoholics.

We are not here to advocate a crusade against alcoholic beverages — we are not here as prohibitionists. We are here as sanitarians to carefully consider facts presented.

It would seem that the use of alcohol produces inefficiency of brain and muscle; breeds insanity and causes poverty and pauperism. These further translated mean immorality, filth, disease and death. In this social, economic and political problem the threads of our science are heavily interwoven. It is for us as sanitarians to recognize the duties and responsibilities of further service to our fellow men.

Experimental Research

One of the greatest fields offered by science to anxious workers is that of experimental research. It has drawn the serious and enlisted the talented energies of hundreds of skilled observers. Are we as sanitarians interested in their work? Let us investigate a little. Since 1893 experimental research work (laboratory work) has—

1. Discovered antiseptic surgery and so made possible the wonderful results of modern surgery.
2. Made possible practically all modern abdominal surgery.
3. Made possible all modern surgery on the brain.
4. Shown how lockjaw spreads from the wound; how sometimes it can be arrested and cured; and still better how it can be prevented.
5. Reduced the death rate in compound fractures from 65 per cent. to less than 1 per cent.
6. Reduced the mortality of ovariectomy from two out of every three, to two or three out of 100.
7. Abolished yellow fever.
8. Made possible cure of hydrophobia.
9. Reduced mortality of diphtheria from 158 deaths per 100,000 in 1894, to 38 per 100,000 in 1905.
10. Reduced mortality of cerebro-spinal meningitis from 80 to 90 per cent. to 30 per cent. or less.
11. Have made it possible to operate successfully for goitre.
12. Reduced mortality of tuberculosis from 30 to 50 per cent.
13. Benefited animals by discovering causes and dangers of tuberculosis, Texas fever, anthrax, glanders, hog cholera and other infectious diseases of animals.

I need not ask you again if we are interested in such work. In our laboratory we prepare the antitoxin for diphtheria for free distribution; the antitoxin for tetanus also free to health officers; a preparation of nitrate of silver for the prevention of ophthalmia neonatorum; and our cancer laboratory located at Buffalo is working vigorously in an endeavor to find the cause and the cure for this deadly disease. Such a problem we attack on the clinical side to see if we can learn anything by such experience; by the microscope to find if the minute study of tissues will reveal the cause;

by the bacteriologists to see if they can discover any germ which may originate the tumor; and finally by animal experimentation to study the life history of such tumors from start to finish. We have not yet found the cause of cancer nor the cure but I know we will.

Opposed to this record what have the foes of research done — the antivivisectionists, as they term themselves, and as they are termed by the silly and sensational newspapers that support them. As Dr. Keene says, they have done nothing but stand in the way of progress. Not a single human life has been saved by their efforts; not a single household made happy; not a single disease has had its ravages abated or abolished.

These four problems so briefly and imperfectly presented may serve to show the diversity and complexity of the questions confronting the sanitarian.

Common Sense in Sanitation

While it is most desirable to have a broad outlook, to survey with a comprehensive glance, if possible, the entire field, it is perhaps of still greater importance to determine wisely exactly what part of the field to occupy.

At present we have so much money and so much energy. Let us use this money and this energy in that part of the field where we feel certain we may produce definite and lasting results. For example, we know how the contagion of certain diseases is spread and we know how to prevent it. Let us take the things we know positively and definitely about, and do what we know will save many lives. We have many associations and charitably-minded and well-meaning people that are stirring up sentiment and increasing the amount of energy and money that can be devoted to public health. It is time that the sanitarians of this country saw to it that that energy and money is wisely used. It is essential that our resources should be devoted to the basic and vital things and not squandered on things which are only theoretical and possible and of minor importance. Sanitary reform is not a matter which can be safely left with medical men as such simply, unless they are trained sanitarians, and it certainly cannot be left to those who are entirely laymen as far as sanitary science goes. Let

us take up the things we can do now and afterward the work that will be waiting.

The highest measure of success in philanthropic work will be reached when the attempt to work in practical isolation and without the co-operation of governmental agencies is abandoned. Whenever success has been attained, the secret has been, not in the discovery of the truth, not in the teaching of it by higher or professional institutions of learning, but in the administrative use of truth, working through governmental machinery. Necessary human uplift work will never be done if philanthropy keeps on trying to take the place of efficient government.

It has been impossible in one brief discussion of public health administration to do more than merely touch upon some of the more salient points. But, if I have been so fortunate as to enlist your interest, in this great object of sanitary science; if it has been granted to me to open the door so that you may have been able to see some way in this great field of endeavor; if I have been able, however inadequately, to show you some of the great honor and nobility of this service, this public service in which we are engaged, I shall be more than satisfied.

THE CHAIRMAN — When Dr. Porter read that list of astonishing triumphs which research is having in its combat with diseases which afflict the public to a greater or less extent, I am sure we all felt we had a profound interest in the fight being made against disease, and for the public health. This side of the subject will be treated by the next speaker of the evening, Dr. Rush Rhees, president of the University of Rochester, who will now address us on the subject, "The People's Interest in Public Health."

DR. RUSH RHEES — Mr. Chairman, Ladies and Gentlemen — The chairman of the evening has very correctly intimated that I might fulfill the task assigned to me by saying that Dr. Porter had made perfectly clear the reasons why the public is interested in the public health. But you will permit me to say that I understand the topic assigned to me is "The Interest of the Public in the Department of Health," in its fight against disease.

THE PEOPLE'S INTEREST IN PUBLIC HEALTH

BY RUSH RHEES, LL.D.

President University of Rochester

It is a matter of great interest that in one of the greatest schools of the country they have established a chair of "preventive medicine." If this makes us think we have been going to school in China, where we understand the custom or habit is to pay a physician, and give him a good salary for keeping you well, and then dock his salary for every day the patient is sick, still it may be that in the passage of years, we will find ourselves more indebted to that particular Oriental people than we think it is possible to do at this time.

You stand as living evidence of the fact that the community recognizes its right to health. The normal condition is health, and where disease is prevalent, there is some ill that should be ascertained and banished. And before proceeding to the reasons why the public is interested in the work which you represent, I desire to give myself the satisfaction in expressing the interest which the public is having in the work being done by the health officers of the State.

I had only yesterday a letter from one of the most eminent statisticians, speaking very warmly of our own State Department of Health. Is it not that the improvement in the last seven or eight years in that department in the gathering and publishing of statistics is something enormous; and these records are now such that the citizens of the State may be reasonably very proud of them.

Standing here as a citizen of Rochester, in a sense having a right to be one of your hosts, as you come to this gathering, I desire to add a word of appreciation for the health bureau of the city of Rochester.

We have a health administration that we believe adds very largely to the value of our city as a place to live in, and to the advantage of our city as a place to work in; and everything done by that bureau for the protection of the people and the prevention of disease and securing to the people the innate right to

health is something that makes us citizens proud; and as a citizen having such pride I have no apology to offer if I exhibit something of that satisfaction. It is not a satisfaction that believes there is nothing yet to accomplish. Least of all is that view entertained by the very efficient health officer who presides over our health bureau in this city.

I think the public's interest is first, that which a merchant has in the cost sheet of his business. One of the essential features of the health office is the publication of statistics. You advise us concerning our death rate in the community; you tell us concerning the birth rate and the frequency of disease, and the localities where diseases are found. You point out conditions in the life about us favorable to or conducive to diseases; you call our attention to the fact that our industry is filling the air with smoke, and that the marvelous use of the automobile is filling the air with dust, and odors, and that since the prevailing use of the automobile, certain diseases are more frequently found. And you tell us that absence of light and air in the home of the poor, and that there are other conditions favorable to the breeding of disease there. You call our attention to the fact that certain conditions make impoverished health almost inevitable. You set these facts before us without any special appeal, and in the form of tables. Figures are probably the most difficult things to understand; and rightly to judge, that can be given to a body of citizens; and sometimes we are tempted as we take up the health report of the Health Department of the State or of the community, we are likely to say "What do we care how many people died from these diseases?" But when you make a comparison and say the death rate in Rochester was so many per thousand last year, and it is so many per thousand this year, and we can see our condition is improved, we then pat ourselves on the back. But if you tell us there is an increase of so many deaths over last year, we may pause for a moment and say, "Why is this? What can we do with this?"

But you gentlemen are always confronting us with this cost sheet, with our municipal and State life, and there is nothing that so deeply concerns the conduct of our life as human strength and life.

The second reason is because, when we learn of unfavorable conditions for life and work, we are solicitous for the improvement of those conditions, and to you we look, because through all the years which have gone you have been our leaders in securing improved health conditions.

I need only mention for the benefit of the citizens here with you, I need only mention four or five of the directions in which these efforts for the improvement of our conditions have been undertaken and fostered by your people. For instance, the improvement of the water supply. The change from the time when in a town like Rochester every man drank water from his own well, or his neighbor's well, until we get to-day water brought here to us, and surrounded with the utmost care in seeing that it is wholesome. That one thing, that is simply an immeasurable advantage. You have given us the luxury of one of the most permanent, fundamental needs of human life. You have given us the advantage of the advertising sort which comes from the fact that a city here or there has a water supply that is wholesome, and adequately protected.

By the same argument we may turn to sewage, but I would not speak on that as you have a master to speak on that subject to you later in the evening.

There is the possibility of very serious danger to the community in this matter; and in the economic distribution and disposal of this waste the opportunity for conserving the financial interests of the community is very considerable. The public is interested in the work which you represent because such things as these are your solicitude and your care. But, more particularly, we look to you for the care and control of infectious disease. Of old, men were disturbed when a pest of smallpox appeared in the midst of a community, and it swept a community as if a scythe of death had swept over it. We have since learned of other pests, foes stealing about ready to attack the people. You have made us to understand that typhoid fever is not a mysterious visitation of Providence, but a negligence or carelessness of the fundamental rules of health. And by controlling the sources of disease you are making our lives more tolerable, more interesting and more full of power and satisfaction.

The last of the great crusades and the greatest of the great crusades, the undertaking of which is of supreme interest to the public, is the crusade, evidence of which is in the room to my left to-night, against the great white plague. Only in the memory of all who are here to-night, have we recognized that that great scourge is, like other pest, stealing and touching one now and then another, but one which can be terminated if the people would heed the counsels and the suggestions which gentlemen like yourselves are constantly giving to us, because your enterprise goes right to the source of the disease, to check and control the ills which threaten us; and because you make our conditions of life wholesome, you interest us.

Only in recent years have we come to appreciate how many kinds of disease are brought to our homes and to our children by milk. And when men like yourselves undertake to clean up this source of supply, and when you demonstrate that the disease-bearing characteristics of milk are identical with the statement that the milk is dirty, you have put us infinitely under your care and obligation. And every effort you put forth to give us that cleanliness and wholesomeness which we have, must be appreciated.

Other efforts for securing pure food apply to this same category which I have spoken of. One other preventive offered is the securing of sanitary tenement-houses. I speak of the tenement-house because the tenant there is less able, either by power or information, to guard against the dangers which lurk there, than a man living in a more adequate place. But in the darkness and dirt and the closeness which ordinarily characterize some of the tenement-house life, you are but characterizing the breeding beds for disease which are to be found. Therefore, when you come before us and say "We must have a law which will protect the community from such breeding places of disease," we respond with appreciation and say that the work which brings the knowledge of these conditions, and sets forth the method for escaping them, is work which should have our approval and support.

The same may be said as to sanitary inspectors in our factories. Now I would like to digress for a moment for a comment upon

this state of the matter: all these efforts for securing conditions favorable to good health mean "Further inroads upon private liberty." There is always someone who rises and raises a cry of "personal liberty," and states that this interferes with his private affairs. If the health officers of any town undertake to secure proper and wholesome conditions of living, whether of food supply or what-not, there is always raised from some quarter the great cry of "liberty" and "infracton of the liberty of the citizen." That is a mighty word, and it makes a strong appeal to some. There are some whose homes have not been visited by such plagues as occur in others, and they say, "Why should any law come in and tell me to clean my factory, or my barn, or to tear down a tenement?" If we like to live in a community, and the phenomenon is that we prefer community life to perfect freedom, it is impossible to live in a community without the surrender of some of this freedom; and the question presented in community life is this: to what extent is the perfect liberty of individual action to be curtailed in order that the perfect freedom of the community life may be obtained?"

The community lays its hand on the individual of the community at any point, and at any time, and it says: You must not or you must do this or that. His liberty to that extent is gone.

When they come with a demand that certain private interests should be surrendered to the public good, only so can we get it where many multitudes of people gather because they find greater satisfaction in the life developed in great cities, than in isolation.

There is one other reason — two other reasons — which I will very briefly give to you for the interest of the public in the work which you represent.

The first is the interest of public economy. Two aspects of economy I would call to your attention. The first is that which comes from the prevention of crime, for it is clear to us that the prevalence of disease, and the development of ill-fed, ill-nourished (in any direction) life has a tendency to increase in insanity and crime. It is overwhelmingly established that the connection is not only intimate but causal. That being true, let us consider what we are paying for prisons, hospitals, asylums and the care

of paupers, those whose efficiency of life has been taken away. What is the total of that expenditure? Is it possible, by preventive effort, to prevent these charges of the State? Our balance sheet will show an advantage if we can reduce the population of these institutions. Then, we should be under great obligation to guides who will show how that can be secured.

Then there is another aspect of the economy. We have congratulated ourselves as a people during the last two or three centuries of the peculiar aptitude of the Yankee — his readiness to take hold of any task and to do it effectively. When we consider why this is, we are forced to see it is because the people who came to make this nation have by that fact been typical of universal energy, and they were forced to put their utmost energy. Inheritance and environment have combined to develop in them the strongest powers found in human life, and these have been found among our people from the beginning. When they leave the task of subduing the wilderness, and turn to other tasks, they have been found equally efficient. But what is to happen when the immigration that comes to us is not the most learned or the most venturesome or forceful of the people of the earth? But instead of that class, it is composed largely of those who are pushed out by the nations, not always famous for the energy and vigor which they have contributed toward civilization. What is to happen when this element becomes significant in our population, and we are no longer a picked people whose life has been developed in a peculiar field? Can we expect the same qualities to be still further developed? Not unless by due care and adoption of the counsel which you men give to us, we see to it that the conditions of life are made as favorable as possible to the development of good minds in sound bodies; and, unless we adopt the measures which you have given to us, can we expect this efficiency to be maintained at that standard?

We are no longer a people who can be satisfied with our home markets. Unless we can retain the efficiency of the man behind the machine, we will not maintain our place in the world's commerce and industry.

Economy of human life and efficiency, and of that element which in the last analysis will determine supremacy, is the con-

dition which indicates to us the supreme confidence the public has in the work which you gentlemen have undertaken and are guiding.

My last word is that the interest in common philanthropy dictates to us profound regard for the things in which you are guiding. If we believe a man is born for living and not for death, for health and not for sickness, and that it is the right of every human being to have an opportunity to grow and fulfill its purpose of existence, all those reasons which appeal in other fields cry out to us to lend a hand to those efforts which shall not cure disease after it is contracted, but prevent the contraction of disease, and thus make the community wholesome and strong because free from evil estate.

SHALL WE CONTINUE OR SHALL WE STOP THE SEWAGE POLLUTION OF STREAMS?

By WILLIAM T. SEDGWICK, Sc.D.

Massachusetts Institute of Technology

It was formerly believed that "running water purifies itself." And so to some extent it probably does. But it is now agreed by all competent sanitarians that to depend upon the self purification of streams for any adequate purification of sewage is to lean upon a broken reed. The long series of epidemics of typhoid fever and other diarrheal diseases conclusively traced to drinking water drawn from rivers polluted with sewage at various distances upstream, has settled this point beyond all peradventure. It is really quiet water rather than running water that oftenest purifies itself, because — for one thing — in quiet water sedimentation or settling takes place favoring the deposit of mud and microbes, and giving disease germs time to die out instead of carrying them quickly and while still virulent to some other place and perhaps some other people. We ought, then, to stop the sewage pollution of streams; because we never know how far down these may carry the germs of deadly diseases, or who may be using the streams below for drinking or other domestic purposes. We know only too well that typhoid fever and other diarrheal diseases are disgracefully common in the United States, and we know also that one of the principal reasons why this is so, is because we so often pollute even our best lakes and rivers with sewage.

But what can we do with our sewage if we do not merely let it run into the nearest stream? The answer is, we must either turn it upon land, for farming purposes as is done with great advantage in some states where irrigation is a frequent necessity; or else we must somehow scientifically *purify* it, removing from it before letting it go into lake or stream so much of its noxious material as is likely to create a nuisance or otherwise endanger the public health. To do this, while not very easy, is now entirely possible, and in every civilized country progress is being made in this direction, although such progress has sometimes been slow.

In England, for example, which was the first country to squarely face and master the problem of the sewage pollution of streams, many years were occupied in investigation and experiment before decisive steps were taken. Massachusetts, profiting by the experience of England attacked this problem about 1880, and met it squarely and vigorously in 1886. Following the example of Massachusetts, the State of Ohio has more recently dealt boldly with the same difficulties; and now the question comes squarely before the great State of New York whether it shall or shall not have the courage to stop the sewage pollution of its streams.

As an aid to the solution of the problem the experiences of Massachusetts may be instructive. In Massachusetts the foundations for the present excellent practice were laid and definite progress was begun by the enactment of Chapter 274 of the Acts of 1886. Under this statute the State Board of Health was given "the general oversight and care of all inland waters" and instructed (among other things) to "recommend measures for prevention of the pollution of such waters" in order "to protect and develop the rights and property of the commonwealth therein and to protect the public health * * *".

"It shall from time to time consult with and advise the authorities of cities and towns, or with corporations, firms or individuals either already having or intending to introduce systems of water supply or sewerage, as to the most appropriate source of supply, the best practicable method of assuring the purity thereof or of disposing of their sewage, having regard to the present and prospective needs and interests of other cities, towns, corporations, firms or individuals which may be affected thereby. It shall also from time to time consult with and advise persons or corporations engaged or intending to engage in any manufacturing or other business, drainage or refuse from which may tend to cause the pollution of any inland water, as to the best practicable method of preventing such pollution by the interception, disposal or purification of such drainage or refuse: *provided*, that no person shall be compelled to bear the expense of such consultation or advice, or of experiments made for the purposes of this act. All such authorities, corporations, firms and individuals are hereby required to give notice to said board of their intentions in the premises, and to submit for its advice outlines of their proposed plans or schemes in relation to water supply and disposal of drainage or refuse. Said board shall bring to the notice of the attorney-general all instances which may come to its knowledge of omission to comply with existing laws respecting

the pollution of water supplies and inland waters and shall annually report to the legislature any specific cases not covered by the provisions of existing laws, which in its opinion call for further legislation."

Time and experience have shown that this act, which still stands upon the statute books with only minor alterations, has been fundamental and fruitful in the control of the pollution of streams and other inland waters by the sewage of cities, towns, villages, and the like.

The authority given under this statute to the State Board of Health to make rules and regulations for the protection of water supplies was first made effective in 1897 and by the revision of the laws is now included in the general statute. The making of such rules and regulations rests of course with the State Board of Health. As a good example the rules made by them for the protection of the water supply of the city of Cambridge are specially worthy of attention.

Since about the year 1888 the laws giving cities and towns authority to construct systems of sewerage have generally contained a clause — providing for the construction of the works in accordance with plans approved by the State Board of Health, and in 1909 an additional act of great importance was passed by the Legislature (Chapter 433) providing for the proper maintenance and enlargement of works for the treatment or purification of sewage — an act greatly needed and very beneficent in its working.

[Chapter 433]

AN ACT to provide for the proper maintenance and enlargement of works for the treatment or purification of sewage.

Be it enacted, etc., as follows:

Section 1. Cities, towns, persons, firms or corporations, owning or operating filter beds or other works for the treatment or purification of sewage shall provide and maintain works adequate for the treatment of the sewage at all times, and shall operate such works in such manner as will prevent a nuisance therefrom or the discharge or escape of unpurified or imperfectly purified sewage or effluent into any stream, pond or other water, or other objectionable result.

§ 2. The board of sewer commissioners or other board or officer

having charge of the sewers in cities and towns shall have authority to make such regulations regarding the use of the sewers as are necessary to prevent the entrance or discharge therein of any substance which may tend to interfere with the flow of sewage or the proper operation of the sewerage system or disposal works.

§ 3. The state board of health, if convinced, upon examination, that a filter bed or other works for the treatment or purification of sewage causes the pollution of a stream, pond or other water, or is likely to become a source of nuisance or create objectionable results in its neighborhood by reason of defective construction, inadequate capacity or negligence or inefficiency in maintenance or operation or from other cause, may issue notice in writing to the city, town or person owning or operating such works requiring such enlargement or improvement in the works or change in the method of operation thereof as may be necessary for the proper maintenance and operation of the works and the efficient purification and disposal of the sewage. In case the state board of health is satisfied after investigation that the unsatisfactory operation of a sewage disposal system is due wholly or partly to the discharge into the system of manufacturing waste or other substance of such character as to interfere with the efficient operation of said works, said board may if necessary prohibit the entrance of such waste or other material or may regulate the entrance thereof into the system, or may require the treatment of such waste or other material in such manner as may be necessary to prevent its interference with the operation of the works.

§ 4. The supreme judicial court, or the superior court, shall have jurisdiction in equity to enforce the provisions of this act upon petition of the state board of health or of any party interested.

§ 5. This act shall take effect upon its passage.

Approved May 21, 1909.

[CHAP. 290, ACTS OF 1909]

AN ACT to authorize the town of Mansfield to construct and maintain a system of sewerage and sewage disposal.

Be it enacted, etc., as follows:

Section 1. The town of Mansfield is hereby authorized to lay out, construct, maintain and operate a system or systems of main drains and common sewers for a part or the whole of its territory, with such connections and other works as may be required for a system of sewage disposal; and, for the purpose of providing better surface or other drainage, guarding against pollution of waters, and otherwise protecting the public health, may lay, make and maintain such main drains as it deems best. For the purposes aforesaid the town

may within its limits, deepen, widen and clear of obstruction any brook, stream or water course, and may straighten or alter the channels or divert the waters thereof, and may lay, make and maintain sub-drains, and, with the approval of the state board of health, discharge the water into any brook, stream or water course within the town. * * *

§ 15. No act shall be done under authority of the preceding sections until the plans for said system of sewerage have been approved by the state board of health. Upon application to said board for such approval the board shall give a hearing, after due notice to the public. At such hearing plans, showing in detail all the work to be done in constructing said system of sewerage, shall be submitted for the approval of the state board of health.

In certain cases also special laws have been passed to prevent the pollution of particular rivers, such for example as the Neponset and the Charles.

Twenty years ago the people in general were comparatively ignorant of the dangers attending the pollution by sewage of lakes, estuaries and streams, and the corresponding state of public opinion made it necessary to educate and advise, rather than compel, communities to beware of the pollution of the waters in their vicinity. And, fortunately for most well-informed American communities, advice publicly given is almost as effective as compulsion, because of the local pride of the people and their sensitiveness to possible criticism under the pressure of public opinion.

We are apt to forget how recent are the teachings of sanitary science. It has been truly said that "the 19th century discovered dirt," and the 20th century is not yet ten years old. We think of the 19th century chiefly as a time of industrial progress, and are too apt to forget that perhaps the most important lesson of that famous century was the discovery that man must look not to the heavens but to the things about him and within him for the sources of his diseases and death.

The modern sanitarian looks upon dirt not merely or even chiefly as distasteful or disgusting. He regards it rather as the ready vehicle of the active agents of disease. The public thinks of dirt as chiefly disgusting and as mostly dry or solid; but the sanitarian knows that the most dangerous dirt is often watery and fluid — as in sewage. Nor is dirt always dirty looking. Some of the worst and deadliest dirt may move absolutely unseen and un-

suspected in waters that look innocent and even sparkling. Little streams of sewage may thus meet and mingle with pure waters, losing themselves completely in the limpid stream, yet loading it with filth and foulness, and charging it with germs of death.

We hear much nowadays of pure food supplies, pure water supplies and pure air supplies; but the removal of the wastes and refuse from our cities, towns, villages, and farmhouses is no less important. For it is with the social organism,—the municipality, the village, the family,—very much as it is with the human organism: to retain putrefying wastes within its borders is an evil similar to that which arises in the human body from undue retention of urine or bowel contents. Poisoning ensues in the one case almost as certainly as in the other.

But again comes the question, what shall we do with the wastes of our cities? Shall we simply throw them, as our ancestors did, in the sixteenth and seventeenth centuries, out of the windows, out of the doors, and out of the houses, into the public streets, filling these with rubbish and wastes, and making it risky for passersby lest slops shall fall upon them from chamber windows? We have certainly got further than this. We remove our wastes from human habitations, employing some form of sewage disposal, refuse disposal and garbage disposal. We get rid somehow of ashes, paper, garbage and sewage. And for the sewage, often the most abundant and always the most dangerous portion of the wastes of habitations, we provide either cesspits, cesspools or sewers. When a small community introduces sewers, it most often turns to the nearest stream as its natural means of sewage disposal, for is not the stream already dirty, carrying, especially in the spring time, mud or rubbish of various sorts, and not infrequently dead cats or dogs? Is not the stream the natural and logical place for disposing of sewage, which after all is only a particularly dangerous form of dirty water? So, at any rate, communities are apt to reason; and as long as the nature of dirt was not understood, and until we had learned that dirt, disease and danger all belong in the same category, there was every excuse for this sort of sewage disposal.

But we have learned our lesson. In the hard school of experience we have learned that hundreds of epidemics of typhoid

fever and Asiatic cholera have come from the use of drinking water tainted with sewage, barely tainted it may be with little stealthy streams of water bearing human excrement. This it is which has given rise to the great problem of sewerage and sewage disposal. And this it is which has caused numerous commissions, especially in western Europe and America to study elaborately the pollution and purification of rivers. This it is which makes urgent the question, Shall the great Empire State of New York continue, or shall it stop, the sewage pollution of streams?

One of the worst plague spots, if not the very worst, in respect to typhoid fever, in the United States to-day is Niagara Falls, in which the death rate from that well-known and preventable disease averaged for the ten years, '97-'07, 124.1 per hundred thousand, the highest during that period having been 181.6, and the lowest 107.9 per hundred thousand. And a careful investigation by Professor Ogden of Cornell University has shown beyond question that this enormous death rate is due almost wholly to the pollution of the public water supply by the sewage of the city of Buffalo.

For the citizens of Niagara Falls this condition is bad enough, but if the consequences were limited to the people of Niagara Falls, the rest of the country might look on with comparative composure. In point of fact, the sewage pollution of the water supply of Niagara Falls is a matter not merely of local, but of national concern, for Niagara Falls is visited annually by hundreds of thousands of people from all over the country, many of whom, after drinking the sewage-polluted public water supply, carry away with them the seeds of typhoid fever with which they afterward sicken, and some of them have died in remote parts of the country or even beyond the country. Furthermore, because every case of typhoid fever wherever it occurs is liable to become a focus of fresh infection, it is impossible to set any limit to the amount of sickness and death produced all over our country and even beyond its borders by the pollution of the water supply of Niagara Falls by the sewage of the city of Buffalo. For these reasons I consider the state of affairs which has long existed at Niagara Falls disgraceful both to the State of New York and to the United States of America. I am accordingly glad to be informed that

active measures are under way for the introduction of an improved water supply into this fever stricken community.

The change in public opinion of late years under the constant sanitary education of the people is not only extraordinary but encouraging, and the time is at hand — if it has not already arrived — when the stain of sewage now almost everywhere borne by our lakes and rivers, must be forever erased. And for this erasure we must look first to the people — and especially to the leaders and representatives of the people, our lawmakers — and next to their official agents, chief among whom are our State Departments of Health. These latter, in turn, armed with the authority of the law and equipped with the appliances of modern science deserve and require the patriotic support of the people.

The recent protest of a distinguished citizen of the State of New York against the conversion of the Hudson river into a sewer is well worth remembering in this connection. The writer, Mr. John Bigelow, through the shades of Hudson and Fulton, cries out — “The river you are making such an ado about discovering and navigating is not the river either of us ever saw. The river we know and which bears one of our names consisted of as pure and delicious water as ever descended from heaven. You have permitted it to be converted into a great sewer into which all the cesspools, barnyards, kitchens, mills and factories between New York and Troy discharge all their polluting exuviae and rubbish, instead of sending them back upon the lands whence they came and which they should enrich. In doing this you have deprived all the river counties of one of their most valuable crops. That river in our time used to swarm with shad, herring, sturgeon, striped bass, bullheads, sunfish and pan fish of many other varieties. These fish used in our times and for many years after to furnish at least one-third of the nourishment of all the inhabitants for ten miles back on both sides of the river from New York to Albany. * * * If you wish to honor us for what we have done, to render this magnificent waterway useful, restore it to the condition in which we left it, and when it was ready to appease the hunger and thirst of millions of people.”

THURSDAY, NOVEMBER 11, 1909

THIRD SESSION, 10 A.M.

Presiding: ALEC H. SEYMOUR.

THE CHAIRMAN — *Gentlemen of the Convention:* It is my very great pleasure this morning to introduce to you a man known all over the confines of the State of New York, as well as over the United States, not only for his great work in the field of education, but his interest in sanitary matters. I am sure you will be pleased to learn what is to be done at Cornell University in instruction for sanitarians.

I take great pleasure, therefore, in introducing to you Jacob Gould Schurman, President of Cornell University.

MR. JACOB GOULD SCHURMAN—*Mr. Chairman and Gentlemen:* I very seldom read a paper, but I must catch a train leaving here in forty minutes, and when you write what you have to say, it has some advantages. You are able to think out your subject with more care, and you are compelled also to condense what you have to say. A man speaking freely, without manuscript, can wander at random as he will. He is not obliged to follow any order, and he is not under obligations to be brief, but as the train cannot wait for me, I have put down in a most condensed form what I have to say.

A SCHOOL FOR SANITARIANS

By JACOB GOULD SCHURMAN, LL.D.

President of Cornell University

I do not propose to take up any of the time of this Conference in presenting facts which are either well known or easily accessible. That human life has lengthened during the latter half of the nineteenth century, about seventeen years, that its length can still be greatly increased, that of the 3,000,000 persons in the United States who are always seriously ill fully half are suffering from illness that is preventable, and that according to the great authority, Pasteur, it is within the power of man to rid himself of every parasitic disease, are matters so well known that they need not be repeated here. Anyone who wants to acquaint himself with the salient facts on the whole subject of national vitality, its present wastes, and the best methods of its conservation, may be referred to the bulletin of Professor Irving Fisher, issued by the Committee of One Hundred on National Health.

The amount of public money now spent in New York State and in the United States in the safeguarding of the public health

is enormous, though it is not possible to determine it with absolute accuracy. The standard source of information is the special report of the Census Bureau on "Wealth, Debt and Taxation." The well-known statistical expert, Professor Willcox of Cornell University, has supplied me with information prepared by himself after conference and correspondence with the compiler of the census volume referred to. Here is an itemized summary of the expenditure for 1902:

Expenditures in 1902 for:	New York State	United States
Health conservation.....	\$1,534,633 00	\$9,460,520 00
Sewers, drainage and other sanitation.....	6,911,047 00	26,417,947 00
Care of insane.....	4,913,615 00	23,021,207 00
Hospital subsidies from pub- lic funds	712,129 00	2,276,336 00
Operating expenses of water- works (estimated).	4,400,000 00	21,400,000 00
	<hr/> \$18,471,424 00	<hr/> \$82,576,010 00
	<hr/> <hr/>	<hr/> <hr/>

In this estimate no mention is made of the cost of charities other than hospitals, or parks and playgrounds, and of many other forms of outlay having a recognized relation to public health.

But the items included amount to nearly eighteen and a half million dollars for New York State and more than eighty-two and a half millions for the United States. The significance of these figures of New York State may perhaps be better judged when we notice that the amount of the taxpayers' money thus expended amounts to more than 45 per cent. of the total cost of public education in this State, more than double the cost of all our courts of law and law officers, double the cost of all the fire departments of the State and more than treble the cost of all our street lighting. Furthermore, there is no branch of public expenditure in which the outlay is increasing so rapidly as in this. It is not unlikely that if similar figures for the year 1909 were available, it would appear that New York State is now spending annually \$30,000,000

from money raised by taxation in these various lines of public health work.

The items mentioned in the preceding table show that the work of the sanitarian is quite distinct from that of the physician. Both, indeed, have to do with life, yet they approach the subject from entirely different points of view. Life has been defined by Herbert Spencer as "an adjustment of organism to environment." The object of the physician's interest is the organism. The object of the sanitarian's interest is the environment. Furthermore, the physician cures diseases after they have occurred. The aim of the sanitarian is to prevent disease. Instead of providing for sanitary science dealing with the environment in which we live, a modern medical course cannot provide for instruction in even personal hygiene. There is no space in the curriculum for the subject of sanitary hygiene. And then, the students of medical schools are not interested. They are only interested in the application of their discoveries to human diseases. Medicine is concerned with chemistry, with physiology, with anatomy. What do the medical men know of the chemistry of foods, of vital statistics, of sanitary engineering? And yet, these are the great and important subjects included under sanitary science. The public might as well awake to the fact that schools of medicine do not consider it as a part of their duty to train men even in personal hygiene much less in sanitary science.

The American people are suffering from the lack of trained sanitarians. Let me read you a statement written three or four years ago by the editor of *Engineering News*, a member of the Board of Health of Montclair, N. J.:

"One of the greatest difficulties which any local board of health has to contend with in trying to put the municipality under its care in proper condition to-day, is the finding of the proper sort of men to carry on the work of inspection and protection of the public health. There is not in the United States to-day any means of providing the training which is necessary for an executive health officer or health inspector, and we are continually confronted in Montclair with this fact."

Two years ago the Commissioner of Health of this State received a copy of a resolution passed by the Medical Society of the State

of New York, at its annual meeting. The import of this resolution was that it was the opinion of the society that only those physicians should be appointed as health officers who could show evidence of special training in public health work, and the inference of the resolution was plainly a request to the Commissioner that his future appointments should be made on this basis. Unfortunately, as the Commissioner pointed out there was then no institution in this State (nor in any other State for that matter) offering courses giving special training for public health work.

It is impossible for the medical schools to provide the necessary training. The medical curriculum is already overcrowded, and the subjects which form the backbone of a course of training for sanitarians, namely, vital statistics, chemistry and biology, and sanitary engineering, are themselves sufficient to fill up a professional curriculum. As Professor Sedgwick has well said:

“It is to-day absurd for the average well-trained medical student to think of becoming an expert in such branches of hygiene as water-supply, sewerage, garbage collection and disposal, gas and other forms of light supply, ice supply, milk supply, the abatement of nuisances, etc. These belong rather to the sanitary engineer, sanitary chemist, and sanitary biologist; to sanitation rather than hygiene.”

What we need is trained sanitarians supported by an awakened and intelligent public opinion. A new profession is rising in this country, and the public interest demands its speedy development. I allude to the profession of the public health officer, a profession already recognized in England by a special diploma. The health officer should wherever practicable devote himself wholly to the duties of his office and be absolutely prohibited from practising medicine. In this respect he should be like the lawyer, who on election as judge ceases to practise law. As Professor Fisher has well said, “No court, police or fire department or any agency of government can be more important to the people than this under the complex condition incident to the rapid growth of both rural and urban populations,” yet I recognize that such officials will not be appointed, or if appointed, adequately supported until public opinion is educated in matters of hygiene and sanitary science.

Therefore, the education of the public is quite as important as the training of scientific sanitarians.

A scientific school in any field whatever ordinarily has three functions to perform. The first is to engage in research in that branch of science to which it is dedicated. The second is to educate in that field the students who matriculate in the school. The third is to promote among the general public such results of scientific investigation as may be susceptible of practical application for the health, prosperity, intellectual or moral improvement of the people. A school of sanitary science should discharge all these functions. It should be a seat of research in sanitary science, a school of professional training for future sanitarians, and an organ for the extension of sanitary knowledge among the people.

Of these three functions of the sanitary school the training of sanitarians and the promotion of sanitary knowledge among the people are the most important functions. Already far more knowledge has been accumulated in this field than is being utilized for either of these functions. I would not, indeed, debar a school of sanitary science from engaging in research. On the contrary, it is my conviction that no scientific school in any field whatever can flourish without research. Men who are not enlarging the boundaries of a science lose their interest and enthusiasm in it and become disqualified either for teaching students or instructing the public. And this is just as true of sanitary science as of any other science. The point of my remark is that at the present time the functions on which emphasis should be laid are the education of young men and women for sanitary officers, and the carrying of elementary instruction in sanitary science to the people at large. Research would doubtless be recognized and I would not exclude it even at the outset, but I would say to the Faculty that the existing circumstances demanded the immediate utilization of existing knowledge rather than the enlargement of knowledge.

I believe that young men and women are simply waiting for an opportunity to enter this new profession. It appeals to their scientific interest because it aims at prevention not merely cure, and it appeals to their moral interest because of its altruism, of the service which it renders to the community. Just now medicine as a science and art of curing disease is failing to attract

a due proportion of students. The attendance in our best medical schools, in most of the medical schools in the country indeed, has considerably fallen off, and I believe that we shall see a change even in the function of the physician. In the field of personal hygiene he will be called on to prevent disease and not merely to cure it. A similar change has already taken place in the profession of law. A generation ago lawyers collected damages for us after we got in trouble. To-day the chief business of lawyers is to guide men in the conduct of their affairs so that they shall escape trouble. A generation ago the practice of lawyers was consequently in the courts. To-day the best lawyers all do their work in their offices. And in medicine as in law, the magic word is coming to be prevention and it is because the sanitarian prevents suffering from disease not only to scattered individuals, but to whole communities, that his calling is in harmony with the best professional spirit of the time and challenges the interest and enthusiasm, and the mind and heart of the rising generation.

The State Commissioner of Health, Dr. Porter, caused last winter to be introduced in the Legislature a bill providing for the establishment at Cornell University of a State School or College of Sanitary Science which would rank with the College of Veterinary Medicine and the College of Agriculture which the State has already established there. A large number of the subjects prescribed in the curriculum of such a school of Sanitary Science are already taught in the different departments and colleges of Cornell University. The number of new subjects to be introduced would not be large. Consequently, the cost of maintaining the school would be small. Furthermore, it happened that though Cornell University is in general crowded, the Medical Department, owing to the recent requirement of a college degree for admission, has room to spare in its building. I believe that in the interest of the public health the people of New York State should support the Commissioner in getting the bill enacted into law this year. I know no other way in which by so small an expenditure of money so much might be accomplished for the health of the State of New York. If the Commissioner secures the establishment of his School of Sanitary Science, I pledge him the cordial co-operation of Cornell University in making its work

effective. The two functions which in my judgment it should immediately undertake are, first, the training of young men and young women for the new profession of sanitarians, and, secondly, extension work in all the municipalities and health districts of the State with a view to educating the people in the most important scientific conclusions reached in this field and the best practical arrangements to be made by the health boards and health officers for protecting, conserving and lengthening the life of our people.

DR. JOHN W. LE SEUR — Mr. Chairman, I move you that the privileges of the floor be extended to all visiting physicians and professional gentlemen.

THE CHAIRMAN: You have heard the motion. All in favor will please say Aye, all opposed, No. It seems to be unanimously carried. I am about to announce that we have a treat that does not appear on the program. It affords me great pleasure to introduce to this assemblage Dr. Rosalie S. Morton, Chairman of the Public Health Education Committee of the American Medical Association.

DR. ROSALIE S. MORTON — If it were not for the cordiality of your reception, I should feel some embarrassment in coming before you, since the motion made a few moments ago was to allow all professional gentlemen the privileges of the floor. There are a number of professional women present at this time.

REPORT OF THE PUBLIC HEALTH EDUCATION COMMITTEE OF THE AMERICAN MEDICAL ASSOCIATION

BY ROSALIE S. MORTON, M.D., *Chairman*

I have been asked to come before you to present the Report of the Public Health Education Committee of the American Medical Association. I am sorry to say that the acoustics in this hall are not very good, and I am going to ask those sitting under the sides of the gallery, if they will not come to the side seats nearer to the front, as I know from my experience, seated there yesterday, that very little can be heard.

The resolution creating this committee was passed unanimously by the House of Delegates of the American Medical Association at its last meeting in Atlantic City, June, 1909.

A meeting of the women physicians of the American Medical Association was called in New York City, July 20th. Women from all over the United States were present and formulated plans for work in women's clubs, young women's christian associations, mothers' and teachers' associations, social settlement clubs, etc., and work is now going forward in Arizona, Connecticut, Georgia, Indiana, Massachusetts, Michigan, Minnesota, New Jersey, New York, Ohio, Oklahoma, Pennsylvania, South Carolina, Washington, Wyoming, Hawaii, and the District of Columbia.

The plan of work is to affiliate through the committee the large amount of public health education now being done individually and by scattered groups of women, to concentrate this work under the American Medical Association, giving unity of purpose and co-operation of effort to all work along these lines for the public good.

This work is directed by a central committee composed of women physicians from different sections of the United States, one from each of the following: Colorado, Texas, California, Illinois, Kentucky, Massachusetts. The secretary, treasurer, and chairman are from New York City. The honorary chairman is Dr. Sarah R. Adamson Dolley, of Rochester, N. Y., the second

woman to graduate as a physician in America, having graduated in 1851. It shows that her good work and that of the women who came after her was needed, and has been cordially received by men physicians, since in less than sixty years, the practice of women in medicine has grown from that of two women to many thousand, working in every State in the Union, with the best men in their State, for the good of humanity.

The work is subdivided under state secretaries, and still further, under county chairmen, whose duty it is to learn what physicians — both men and women — will be willing to deliver lectures on the following subjects:

The cause and prevention of ordinary colds.

The value of pure food in the physiology of digestion.

The chemistry and economic value of food and the care of the food in the home.

The relation of pure water to the public health.

The water-borne diseases.

The value of exercise and rest to the public health.

The causes and prevention of nervous exhaustion and prostration.

The use and abuse of stimulants and narcotics.

The importance of the standardization of drugs.

The prevention and cure of tuberculosis.

The air we breathe and the value of ventilation.

The relation of flies, mosquitoes and other insects to public health.

The care of the sick at home.

Pure milk and infant hygiene.

The hygienic management of nervous children.

The prevention of acquired deformities.

The prevention of Fourth of July injuries and tetanus.

The relation of teeth to good health.

The prevention of diseases transmissible from animals to man.

The importance of the early diagnosis and treatment of adenoids.

The causes and prevention of deafness.

The causes and prevention of blindness.

The causes and result of eye-strain.

The value of vaccination and serum-therapy.

The need of medical inspection in the public schools.

The advisability of a National Board of Health.

How to instruct children concerning the origin of life. (This to be presented before teachers and mothers.)

The care of the health during the menstrual period.

The responsibility of girlhood to motherhood.

Pregnancy and the Menopause.

The value of the early diagnosis of cancer in women.

The value of animal experimentation in surgery, in nutrition, in diabetes, in nervous diseases, in tuberculosis, and in infectious diseases.

The responsibility of boyhood to fatherhood.

The prevalence and prevention of venereal diseases.

Social hygiene. How parents may protect their sons and daughters from immorality.

Women physicians, as members of women's clubs, etc., come in contact with a vast number of women, and we have learned that what Dr. George W. Wagoner, of Johnstown, Pa., said lately in his presidential address to the Medical Society of the State of Pennsylvania, is true; namely, "Doctors are losing the confidence of and receiving criticism from the laity." This is largely due to the fact that throughout the country the public is being exploited by pseudo-scientists who affirm that we, the so-called "drug-doctors," are commercially interested in keeping the people ill, while they are working to prevent disease.

The laity is much interested in public health education, the psychological moment has come, and it would be a serious reflection upon our profession if we did not now combine with the health officers to educate the public to a thorough appreciation of the position of the doctor as the protector of the health of the community, and thereby emphasize the fact that this desire to educate the public for the prevention of disease is general among physicians. I come before you as chairman of this committee to ask your hearty co-operation as individuals, and as members of the New York State Department of Health, in this work of service to our country, for you know so well how to develop every sanitary measure and you so successfully protect the health of

the community that in the beginning of this work we wish to lay our plans before you and request that you will freely make suggestions as to how we may increase our usefulness for we wish to be guided by your greater experience and each of our county chairmen will depend upon your co-operation for the fullest success of her work.

We have received letters expressing hearty interest from chairmen of other committees of the American Medical Association and other representative physicians all over the United States, expressing their satisfaction in the plan of work outlined by this committee and their desire to co-operate in every way for mutual service to humanity. Among these were letters from Col. William G. Gorgas, President of the American Medical Association; Dr. Prince A. Morrow, Chairman of the Executive Committee of the American Medical Association Section on Preventive Medicine and Public Health; Dr. Frank Van Fleet, New York Representative of the American Medical Association Board of Public Instruction on Medical Subjects; Dr. Samuel G. Dixon, Commissioner of Health, Pennsylvania; Dr. William Brumby, Health Officer of Texas; Dr. Gardner T. Swarts, Health Officer of Rhode Island; Dr. Eugene H. Porter, New York State Commissioner of Health; Dr. Albert H. Garvin, of Raybrook, Superintendent of the New York State Hospital for Incipient Tuberculosis; Dr. Thomas Darlington, Commissioner of Health, New York City; Dr. Harvey W. Cushing, of Baltimore; Dr. William J. Mayo, of Rochester, Minn.; Dr. S. McCuen Smith, of Philadelphia; Dr. Clarence Wheaton, Dr. William H. Wilder, Dr. Geo. C. Shambaugh, Dr. Chas. W. Robertson, and Dean Wells, of the University of Chicago; Dr. Harvey W. Wiley, Chief of the Bureau of Chemistry of the U. S. Department of Agriculture; Dr. Reid Hunt and Dr. George M. Kober, of Washington, D. C.; Dr. F. Park Lewis, Chairman of the American Medical Association Committee on Ophthalmia Neonatorum; Dr. William H. Welch, of John Hopkins University; Dr. W. Schier Bryant, Dr. O. H. Rogers, Dr. Simon Flexner, and Dr. Pedersen, of New York; Dr. Crothers, of Connecticut; Dr. J. N. McCormick, Chairman of the American Medical Association, Committee on Organization; Dr. C. A. L. Reed, Chairman of the American Medical

Association Committee on Legislation; Dr. Frederick P. Henry, President of the Philadelphia County Medical Society; Dr. Milton J. Rosenau, formerly of the Public Health Service of the United States, now Professor of Harvard, and Surgeon-General Walter Wyman, of the United States Public Health and Marine Hospital Service.

Dr. M. May Allen of this city is New York State secretary of our committee, and we hope through your co-operation with her and with the various county chairmen, to make New York the leading State in this national movement for lessening human suffering and saving human life.

CHAIRMAN SEYMOUR—I am sure you have all been very much interested in hearing Dr. Morton tell of the work of this committee; and I think I can say for all that she will have the hearty and cordial co-operation of the health officers of the State, and the State Department of Health in every way that we can do so.

The Commissioner desires me to make an announcement that there will be a smoker to-night at the Powers House, and we will there get an opportunity to meet several gentlemen who are on the program for to-morrow.

Surgeon-General Wyman and Dr. Wilbur, from Washington, are in the audience now, and I wish they would come to the platform, as I wish to have their moral support if I can get it, in conducting this meeting.

You will notice by the program that following our usual custom, we inflict one paper on legal topics upon the delegates. I know this is not a particularly interesting subject, but some of the men feel we must have something of the kind, and it is my misfortune to have to present this to you.

THE PUBLIC HEALTH LAW

BY ALEC H. SEYMOUR, Esq.

Secretary, State Department of Health

The Public Health Law is of vital interest and importance to every citizen of the State, and especially so to those officers of government called upon to administer or enforce it. In reviewing the addresses presented at our Conferences there will be found a number on legal questions, some of which discuss many practical questions of value.

The difficulty of undertaking to speak fully and clearly on any one phase of our laws is apparent, and I shall not burden you with a paper replete with legal decisions, from which you could glean but little, but will endeavor to point out the development of the law and its great defects in this State, believing that this will be of greater value, as the subject does not appear to have been treated in this way at any of our meetings.

Ruskin once said: "Any interference which tends to reform and protect the health of the masses is viewed by them as unwarranted interference with their vested rights to inevitable disease and death."

That this cynical remark contains an element of truth the experience of those eager to build up legislation as affecting public health would seem to indicate. The law is a subject of giant proportion. It surrounds every profession, and every trade; guides, controls and directs our actions in every phase of life. It safeguards the weak and restrains the powerful. In its support and enforcement, society is safe; without it we become the prey of every enemy of mankind.

But, notwithstanding public prejudice and indifference to legislation designed to improve and protect public health, there have still been marked advances made. Our Legislatures have acquired a marvelous capacity for laws, and we have developed in this country a most astonishing industry in putting new statutes in effect.

In an address recently, the Right Hon. James Bryce, British Ambassador, said:

"The out-put of legislation has of late years been incomparably greater than in any previous age."

So during this period it is not surprising that we should have many new laws affecting public health, though the ground is certainly not properly covered even yet.

The Public Health Laws of a country, State or community are of the utmost importance to every inhabitant. Nor does the interest cease there, for so bound up are we in our relations to our fellow men that the health laws, regulations and ordinances of other countries, cities and communities and the manner of their enforcement become almost as important to us. In the enforcement of such laws we are brought face to face with the fact that in these days of tremendous activity and commerce, of rapid immigration and of easy intercourse between the countries of the world, when many of our uneasy millions of people are constantly passing from one place and from one country to another, the opportunities for the spread of epidemics of contagious diseases are continual and are constantly on the increase.

The attention paid to the subject of public health in recent years, the quickening of the public conscience regarding improvements in our manner of living, the value and necessity of sanitary reforms along many lines and the fact that the intelligent public must be protected from the ignorant and careless, would indicate that our improved system of safeguarding the public health was a thing of recent growth. But while it is true that we have made tremendous advances in the last twenty-five years in our scientific knowledge of the causes of disease and also in sanitary science generally, the fact remains, and the student of history knows, that some of the ancient nations understood in many respects the value of sanitary methods of living and that they paid intelligent attention to the subject.

In early history we find a code of sanitary regulations given for the children of Israel through Moses which could still be applied with good results at certain localities in any of our States. Indeed, the commands laid down in Leviticus and Deuteronomy to the children of Israel for the preservation of their health and safety could still be read with advantage by many of the civilized and educated inhabitants of the globe in the twentieth century.

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It is well known that some of the older countries understood the value of a pure and never-failing supply of water and the water supplies of some of the ancient cities would put to shame those in use in a number of the cities in New York to-day. A comparison of the system of public baths in Rome with the entire lack of such facilities for personal cleanliness in many of our modern cities is enough to make one pause and ask how far we have really progressed.

So also, we find in Rome laws against the adulteration of food and other restrictions designed to protect the health of the Roman citizen, the brilliancy of whose empire can never fade nor pass from the minds of civilized men. So from those early days to the present time we find that every *civilized* government has recognized to a greater or lesser degree the absolute necessity of laws which would protect mankind against their own indiscretions and neglect of sanitary precautions. As a result, we find the countries which have exercised the most careful restrictions have been the most free from the plagues which have scourged the old world to such a startling degree. The great improvement in methods of living, the introduction of proper water supplies and sewerage systems and the constant vigilance of the health official have rendered almost impossible to-day, a repetition of the epidemics which formerly swept over the old world, and which caused such tremendous mortality.

It is said that the black death in its European invasion in the fourteenth century caused the death of 25,000,000 of its inhabitants. You are all familiar with the ravages of cholera and other diseases, the appalling accounts of which are recorded in history. The introduction of sanitary improvements and proper preventive measures have rendered a repetition of such calamities practically impossible. Yet with all the striking advances that have been made, it is with difficulty that the public can be convinced of the importance of the prevention of disease.

We know the tremendous price in lives and money paid by the world for its neglect of sanitation and it is a sad commentary on our much vaunted civilization of to-day, that with the scientific knowledge which we now possess and our demonstrated theories of causes of disease and their prevention, we still allow consump-

tion, typhoid and other preventable diseases to exact such an enormous toll of loss and suffering from our fellow men.

The welfare of State and citizen alike demands that the law-making bodies should recognize the necessity of protection against the ignorant and vicious to the end that their lives and habits should be regulated in such a manner that they should not be a danger to others.

THE RIGHT TO ENACT HEALTH LAWS

If you grant that the welfare of the State is served by its protecting its citizens, then it needs no argument to demonstrate the right of the State to enact such laws as are necessary to accomplish this purpose even though the effect of these laws is to interfere with individual freedom and the use of private property. Our courts have almost universally recognized this right and when called upon, as they often have been, to uphold laws designed to protect public health where liberty of action of the individual has been restricted, they have shown their wisdom and have established the health official in a firm position. The principles upon which these rights are established rest upon the broad foundation that everyone owes a duty to his neighbors to do nothing to imperil their lives or health. The interest of no one can be higher than his neighbors', and he may be restrained from injuring the community, although he may live and die as he pleases, provided he does not endanger the life or well-being of others. It would seem, therefore, that it was one of the most important functions of government to provide for the welfare of the people by uniform laws designed to promote public health. Indeed, society could hardly exist without such laws and every instinct of self-preservation justifies their adoption.

Despite the general indifference to the subject, statesmen long ago appreciated the importance of legislation to preserve public health and raised their voices in its behalf.

Lord Derby realized, however, the ineffectiveness of health legislation without an intelligent public opinion behind it, when he declared long ago that "no sanitary improvement worth the name will be effective, whatever acts you pass or whatever powers

you confer upon public officers, unless you can create an intelligent interest in the matter among the people at large."

The subject was splendidly summed up in New Orleans in the year 1880, by Hon. Erastus Briggs, a member of the State Board of Health of New York, created that year.

He said, "*I place the subject of health as among the first, if not the very first, in the science of political economy. It is a question which belongs to the wealth of the Union and the prosperity of the people. . . .*

"A most important state duty is the enactment of wholesome laws to prevent disease. This is done without infringing upon the personal or political rights of any citizen. . . .

"A decent care for the people of the state and a decent respect for the government by the people establish reciprocal relations which no party can neglect."

Acting therefore upon the advice of statesmen and scientists, and firm in a position that cannot be successfully challenged, our law-making bodies entered upon the task of affording the necessary statute authority to accomplish the desired. How well they have succeeded, and what some of the defects and requirements of to-day are, I shall endeavor to show.

THE GROWTH OF THE LAW

In furtherance of the principles we have exhibited, governments have from time to time passed laws designed to regulate and protect public health. Starting with the simplest regulations designed to insure personal cleanliness and habits and for the use of unadulterated food, we have seen the vast and complete system of modern living develop to a point where laws and ordinances are required to meet every new condition that arises.

The changes in modern methods of living from those when each family prepared its own food and when the country was sparsely settled, to the present time when we find our population crowded together into tenement and apartment-houses in our cities, have developed new and modern methods of protecting and fostering the health of the people. The advance in knowledge of how diseases are spread, particularly the discovery of the germs

of diseases and the work of bacteriology have wrought a great change in the care of cases and their relation to the general public.

Modern mechanical and electrical inventions have wrought a necessity for regulations as to their use. The vast immigration of citizens from one country to another and the consequent necessity for guarding against diseases has obliged us to establish quarantine stations at our seaports and make a careful examination of each vessel, its cargo and passengers, before we allow them to enter. To-day the commerce of the world is enormous, opportunities for infection and the spread of diseases are practically unlimited and we must even interfere with commerce to save ourselves. It is therefore apparent that our health officers and our law-giving bodies have had many new and complex problems to solve and are obliged to pass upon new ones almost every day.

As might be expected, we find little uniformity in public health legislation in our many States. Some few have gradually developed, and by passing new statutes as the occasion required have built up a fairly comprehensive system. Others have created a State Board of Health, given it small powers and less funds and accomplished but little. Many are now awakening to the importance of the subject and are ready to put in force laws which will be of great and lasting benefit.

The health laws cover a wide range of subjects, including the protection of public water supplies, the control of contagious and infectious diseases, the disposal of sewage and pollution of streams, vital statistics, nuisances, vaccination, and many other topics. No attempt will be made here to speak of any other than those immediately concerning the State Department of Health or local boards, and references to the Public Health Law generally should be understood as excluding the other provisions which deal with subjects we are not called upon here to discuss.

THE LEGAL AUTHORITY AND THE POLICE POWER

Having attempted to give you some idea of the field to be covered by the law, let us see where the legal authority is vested and how it is exercised. As we have in the United States no National Department of Health and therefore no branch of the

Federal Government dealing directly with this subject, the matter becomes one almost entirely for State and municipal regulation and the States of our Union have widely varying acts covering the subject. Pennsylvania and New York have a State Department of Health with a single head or Commissioner of Health, while most of the States have a State Board of Health usually made up of physicians with the secretary as the executive officer. In addition to this, there are local boards of health or health officers, or both, given arbitrary powers to regulate, protect and preserve the public health.

As you well know, the States of this Union surrendered to the Federal Government only such powers as were necessary to provide for the common defense and promote the general welfare of all the people of the United States. They reserved to themselves the sovereign control over their internal affairs. The authority of the State is supreme and exclusive in this regard. In the exercise of this unlimited jurisdiction within the Constitution over all persons within its limits and acting under what is called the *police power*, the State imposes the health laws, and the Legislature has a vast power in its possession which it can exercise, provided it does not exceed the legislative functions vested by the Constitution.

The exercise of the police power being for the promotion of the public good, it is therefore superior to private rights and interests and under it the State can impose such restrictions as are necessary to secure the health and safety of the public, so manufacturers in businesses of various kinds may be restrained or discontinued and the rights of the individual subordinated to those of the public. So the owner of property, although holding an absolute title, must use it in such a way that his use of it shall not be injurious to the rights of others. The citizen must regulate his conduct and conduct his affairs so that they do not come in conflict with the general rules for the common good. But the power of the Legislature is subject to the provisions in the Constitutions. The fourteenth amendment to the Constitution of the United States declares that:

“No state shall make or enforce any law which shall abridge the privilege or immunities of citizens of the United States,

nor shall any state deprive any person of life, liberty or property without due process of law nor deny to any person within its jurisdiction the equal protection of the laws."

but it has frequently been held that this amendment does not abridge or impair the exercise of the police power of the States and apparently the principal purpose of this provision is to prevent any arbitrary interference by State authority in the rights of person and property and to secure to all happiness unrestrained except by equal and impartial laws. No greater burdens may be laid upon one than are laid upon others in the same calling, and in the administration of criminal justice no different or higher punishment shall be laid upon one than is prescribed to all for like offenses.

The police power may be used to regulate the use of property, and the protest that is so frequently raised in regard to the exercise of many of the health laws, to the effect that this is a taking of property without due compensation, cannot be sustained. For while the owner is restricted in the use of his property it is not appropriated and in the theory of the law he is compensated by sharing in the general benefits which the requirements are calculated to secure.

But while the Legislature can pass laws needed to protect the public health and the courts cannot review its discretion in this respect, these laws must have some relation to the end to be attained, for the rights of the citizens cannot be invaded by the Legislature under the guise of a police regulation for the protection of health. Where it appears that that is not the object of the statute and no matter in what language the statute may be framed, its purpose must be determined by its reasonable effect and it cannot impair or destroy rights secured by the fundamental law. The Legislature can pass laws to prevent injury to the public but they are, of course, subject to review by the courts and they cannot go beyond the necessities of the case. Many interesting and conflicting opinions have been rendered in our courts upon the intricate questions involved, which I shall make no attempt to review here.

FEDERAL AND STATE CONTROL

But few people remember that at one time there existed in this country a National Board of Health created by act of Congress in 1879, consisting of seven members appointed by the President and created to make investigations and perfect a plan for a national public health organization. The scheme of co-operation of State and local boards was excellent, but unfortunately the board survived but a few years, Congress failing to make appropriations to maintain it.

This is of especial interest at this time when a strong effort is being made by organized bodies to create a National Department of Health. There are, of course, many regulations of different departments of the Federal Government and acts of Congress which have a bearing upon public health. The Federal Pure Food Law and the laws requiring meat inspection are notable illustrations. There is also the United States Public Health and Marine Hospital Service which does some very effective work in the study and control of contagious diseases and in other important lines, and which holds an annual conference with the State Boards of Health, but it cannot at present deal with general public health problems as a properly equipped National Department of Health would. Legislation has been introduced to strengthen their hands, give more authority for investigation and increase their usefulness and I sincerely hope Congress will pass it. The United States Census Bureau makes a careful and complete study of the vital statistics of the country, and is doing valuable work.

While I am heartily in favor of extending the field of the Federal Government in public health work, the excellent service being performed by existing branches of government should be recognized, and it is clear to anyone with practical experience in public health administration, that some of the things it is proposed to have a Federal Department of Health undertake are practically impossible.

Many organized bodies and voluntary associations are to-day clamoring for a Federal Department of Health, for more State control, and for larger expenditures of public funds for the protection of public health,

We should welcome them all for their influence is good, and the publicity attained will be of benefit to the work, but it is strange how seldom any of these associations make an effort to support or strengthen existing agencies.

I believe their efforts ought, in part, at least, to be directed to the assistance of those departments of government already engaged in this work and to those officials now struggling to promote the public welfare with inadequate laws and insufficient funds.

The statutory provisions defining the powers and duties of State boards or departments of health in the different States of our Union vary greatly, although of late years there has been some attempt at uniformity in the work and where one State Board of Health has done effective work along certain lines the others have been quick to follow. As a general rule, State Boards or Departments of Health are not vested with large powers, although there is a very widespread popular impression that they have practically unlimited authority. As a matter of fact, Legislatures have been slow to grant authority to State health officials and for years many of them have investigated and pointed out conditions sadly in need of improvement without the authority to force the desired end. The functions of a State Board of Health should be largely supervisory — the local boards of health should be so organized and equipped that local nuisances and minor matters of that character could be speedily determined by them and the State Board of Health could exercise its powers in the control of more important matters. In the prevention of the spread of epidemics of disease and safeguarding public water supplies and the protection of the stream from pollution and in countless other ways, all involving matters which no one local board of health could possibly be in a position to undertake, the State Board of Health should be supreme.

Most of the States give the State Board of Health a practically unlimited authority to investigate, but along few lines do they have the authority to make their recommendations effective. They usually are required to collect the vital statistics of the State and study the sources of mortality and the effects of localities, employments and other conditions upon the public health.

The earliest laws on the statute books of the State of New York regarding public health were the quarantine laws for the port of New York, the first one of which was passed by the General Assembly of New York in 1758. The epidemic of yellow fever which prevailed in New York City at that time called forth the act of 1799, which authorized the erection of a hospital on Staten Island. For the first time, in 1801, vessels with cargoes from infected ports were prohibited from approaching to the wharves of the city.

In 1801 the resident physician of the Maritime Hospital, the health officer of the port and the health commissioners were constituted a board of health for the city of New York. In 1803 yellow fever again raged in the city and an act was passed in 1804 which prohibited vessels from infected ports approaching nearer than 300 feet of the wharves of the city. Cholera, which was prevalent in 1831 and had a very large mortality in the city of New York, called forth legislation in 1832.

This is, in brief, the history of the earliest legislation in the State of New York attempting to regulate matters relating to public health.

The legislation which marks the commencement of the existing Public Health Law of the State of New York began in 1847, when an act was passed providing for the registry of births, marriages and deaths in this State. Frequent additions were made to the provisions of the Public Health Law down to the year 1880, when an act was passed creating a State Board of Health and defining the powers of the board.

This marks the beginning of any comprehensive plan by the State for the protection of the public health, the registration of vital statistics and the direction and assistance of local boards in the performance of their duties.

In 1893 the Legislature passed a bill (Chapter 661) received from the Statutory Revision Commission, which codified all the health laws of the State and repealed a large number of acts scattered through the statute books from 1854 to that time. Some important amendments were added to Article I, conferring power upon and prescribing the duties of the State Board of Health. It extended the powers of the State Board of Health in some

important particulars. It conferred authority upon the State Board of Health to enter into a municipality and appoint a health officer for it to perform the duties of the local board until such time as the authorities shall appoint a board that conforms with the law. It also placed under the jurisdiction of the State Board lands taken over by the State for sanitary purposes. This amendment was found necessary by reason of the experience in 1892, when cholera was in the bay of New York City. It further required local health officers to report such contagious diseases as the State Board might require.

Acting under this revised and codified Public Health Law, with occasional amendments thereto, the State Board of Health proceeded up to the year 1901. During the organization of the State Board of Health from 1880 on it had been divided into committees to whom various matters were referred and had maintained an office in Albany with a secretary as the executive officer and whose duty it was, in large part, to see that the provisions of this law were enforced. The State Board and its separate committees met at frequent intervals, usually quarterly or monthly, directed investigations and carried out the provisions of the law generally.

In 1901, by Chapter 29, the Legislature passed an act amending Chapter 661 of the Laws of 1893, creating a State Department of Health and the office of Commissioner of Health, and abolishing the State Board of Health. This act in effect conferred upon the Commissioner all the powers and duties originally held by the State Board of Health.

The action of the Legislature in abolishing the State Board of Health and creating the State Department of Health was radical and without precedent among the States of the Union. The State Board of Health had been in active operation for twenty years before the passage of this act, had done some effective work in investigations, in the control of diseases, protection of the public health, etc., the importance of which can hardly be overestimated. It is a fact, however, that the organization of the State Board as it existed necessarily very frequently delayed prompt action upon the various matters before it and it is safe to assume that the action of the Legislature in abolishing this State Board

and creating the State Department headed by a single Commissioner was for the purpose of rendering more effective the work of the State Department along these lines, to facilitate prompt action and to gather into one strong hand the various powers heretofore delegated to committees and thereby to improve the efficiency of the work of enforcing the provisions of the Public Health Law. The department has, therefore, been in operation nearly nine years, during which time numerous additions have been made to the powers already conferred upon it.

Pennsylvania followed the example of New York a few years ago and created a State Department of Health, but unlike New York it has been willing to expend large sums of money for the enforcement of the laws, and in many respects stands in a unique and over-shadowing position among the States of the Union in public health work.

MUNICIPAL REGULATIONS

Municipal corporations can be created in several different ways. Some cities and villages have granted them a special charter from the Legislature, different, perhaps, in its form from any other. Others are organized under the existing State laws and the powers granted are similar to those given to other places, but usually the municipal corporation has the power granted to it very expressly in the charter or by a general clause under which the corporation is organized to adopt regulations for the protection of the lives and health of the people, subject always, of course, to the provisions of the State laws. In other words, the State delegates to corporations organized for local self-government, the power of legislating in respect to these matters, although this power is always under the control of the Legislature and may be changed at any time.

So we find cities and villages of our States passing ordinances and regulations to provide for the abatement of nuisances and the reporting of cases of contagious diseases and prohibiting a large number of different acts which it is believed would be injurious to the public health. In the enforcement of these ordinances they can, of course, use the police officials of the city and in a properly governed city we find more regard for sanitary laws than we do in the rural districts. The ordinances and regulations adopted

are, of course, operative only within the corporation limits, but they cover an extremely wide range of subjects. The charter of the city of New York provides for the organization, authority and duties of the City Department of Health, and gives it wide powers and authority to control all matters affecting public health. We find in New York City a high development of public health work, and a splendid organization which has accomplished much, difficult as the problem is. The Sanitary Code of the city of New York contains several hundred provisions, all having a bearing upon some matter relating to public health. These ordinances must of course be reasonable, consistent with the charter and with the legislative policy of the State, and not discriminating in their operation. They usually fix a penalty for their violation. The scope of these ordinances of course varies widely in different States and in different parts of the country and some of them are very curious and very interesting. In New York State there are over 1,400 local boards of health each having local ordinances and regulations, in addition to our laws.

Municipal control is extremely important in the consideration of this subject as the municipal ordinances having the force and effect of law come very close to the people and must be constantly observed. The housewife who is hauled into court for leaving the garbage can upon the sidewalk and the man who is fined in the police court for spitting in a street car, both learn to respect health regulations. All kinds of business are regulated, unhealthful and unwholesome foods are seized and destroyed, offensive trades are banished from the city, and the keeping of animals is carefully regulated.

DEFECTS IN OUR LAWS

While an attempt has been made to point out the progress there has been in legislation as affecting public health, no one should infer that we have developed anything approaching a perfect system.

Public sentiment has been slow to crystallize in favor of sanitary reforms, and such legislation as we have had has usually been brought about by the work of a few enthusiasts rather than from force of public opinion.

New York is not alone in her difficulties in securing proper laws for other States have also experienced this, but the fact remains that the Empire State is far behind the position it should occupy in this regard and has been sadly neglectful of many important matters. Legislation has been recommended repeatedly on many subjects, but seldom has it been enacted into law. To recite the discouraging and fruitless efforts to secure proper public health laws in this State would be wearying to the flesh.

Our present laws are in many respects sadly out of date, and need a careful revision. The great difficulty seems to be in interesting our legislators in questions of this kind. Any public health law that is of any value will sometimes conflict with local desires, and here a great obstacle is met with, each legislator heeding the protests of his people, as a result defeating legislation for the general good of the State. This shows a lack of statesmanship not for the best interests of the people at large.

Sanitary work must, of necessity, be largely local. Proper State authority is necessary and every State needs a strong and capable State Health Department. But a large part of the work will continue to be done and must be done by the municipalities of the State. The question in New York State is, I believe, how to make the work of local boards of health more effective. My firm opinion in the matter is that the time has come when we should consider the desirability of changing our system of local boards.

They fail of effectiveness at many points, and from lack of knowledge often fail to support the health officer, where his medical training shows the wisdom of action. The system is an old one, but it is obsolete in many ways. The authority should be in the hands of trained health officers, with authority to act promptly. The laws should be made more definite, so that it would be clear where the health officer had power; as our laws stand at present it is impossible in many cases for a board of health to know whether or not they can act with safety.

There should be some more effective system of control over local health officers by the State. Where indifference, neglect of duty, or inefficiency prevails, the State Department should be able to step in and act with a strong hand, for the protection of the citizens of the State, and until this is done we will have

avoidable epidemics of disease and unnecessary sickness and death in many places.

The power now vested in the State Commissioner of Health to investigate and recommend is well enough, but fails of its purpose in many instances. Not long since the department recommended that a village take steps to clean up its watershed. Through the almost criminal neglect of its board of water commissioners this was not done, and as a result there was an epidemic of typhoid, with over 70 cases and 20 deaths. The expenditure of a few hundred dollars would have saved this. The dangers of neglect are not confined to any locality, for every citizen of the State is affected and may suffer.

Our laws regarding the pollution of streams need a thorough revision if effective work is to be done. To attempt to point out all the needed changes would be fruitless. You are all aware that in many important respects these laws need revision. We hear a good deal about needed changes in criminal law; the State has revised its banking and insurance laws; and any legislation affecting a commercial interest, or our financial supremacy, is carefully considered, but the Legislature with a few exceptions is indifferent to the needs of public health. Worse than this, they are not willing to be guided by those who should know what needs to be done along these lines. Ours is a great State in many ways, but not yet great in its care of the public health.

The educational work that is being done will effectively arouse the public, and we shall then have the legislation we need — but not until much needless sickness and death have been caused. Every man here should do his part to see that the Legislature realizes that public health questions are entitled to proper attention and consideration.

Our duty is clear, we must exhibit the interest we feel and show it effectively. We need, more than any spasmodic reform, that high ideal of citizenship and its opportunities which will place our public affairs on a higher plane, give us better qualified officials, more intelligent consideration of the wants of the people, and a better understanding of our own needs and responsibilities.

And in the place of general indifference we must have an active and hearty public support of earnest and intelligent public

servants in every line of endeavor where they are urging proper measures.

THE CHAIRMAN — Gentlemen, that paper is open for discussion. There are the names of several gentlemen on the program, who may care to say a few words in relation to it.

DR. JOHN W. LESEUR — I want to acknowledge with becoming contrition that I merited the brilliant reproof which the lady (Dr. Rosalie S. Morton) gave me in saying that the privileges of this convention should be extended to both ladies and gentlemen professional, and I want to state, as the action was unanimous, that we should apologize to the ladies, and say, that in a general way, in any motion that a physician makes, professionally, that it is his intention in every proper and dignified and courteous way, to embrace the ladies.

I have listened to this paper of Mr. Seymour with profound interest. I believe that in the opening sentence of this paper is a watchword which may well be adopted by every health officer in the State. The Public Health Law is of vital interest to every citizen in the State. That is a statement broad as truth and high as a noble purpose, and as wide reaching in its scope as the hopes of humanity. We cannot too fully appreciate nor too deeply realize the importance of the paper to which we have just listened. The importance of the topic, the Health Law, the fundamental government of the citizens of the State in their effective carrying out of the law, the relation to citizen of the law which the citizen, through his representative, establishes for the government of the citizen, these considerations are vast in their comprehensiveness and importance.

The importance of the Public Health Law is just being realized by us. The essayist in an exhaustive way related for you and me the importance of the Public Health Law in its various ramifications, for there is no department of human life which is not touched from center to circumference, by this Public Health Law; and from the highest official in this department down to the humblest citizen who strives to do his best on the four corners somewhere, where circumstances may have placed him, the importance of our part in this great work cannot be overestimated.

If time permitted, it would be interesting to dwell upon this topic, but the essayist spoke learnedly on the question of the law; and I doubt not it was a matter of profound regret to him that more cannot be said on this subject.

We have enacted laws of every kind. We have sent our more or less intelligent legislators to our halls of legislation, and they have striven to enact laws which they termed for the benefit of humanity, and although there have been laws for the great and small, laws for the actual control and benefit of the public health are not as numerous and concise and helpful as you and I wish they could be.

So no more can be said on the topic of the Public Health Law than at the present time it lacks development, and needs a scientific care which President Schurman referred to in speaking of the establishment of a training school for sanitarians. That shall make it possible to present to the citizens a law which shall commend itself to their judgment, and demand from them such hearty support as makes law most effective. If we had the time, and there was nothing better waiting for us, we could dwell on this topic for some time.

But let us now pass to the defects in the law referred to by the essayist. It is not very difficult to find fault even with a very good law, but I also submit for your approval this statement: that in the Public Health Law, in comparison with the laws of the State, a notion that the defects in the Public Health Law are glaring, that the Public Health Law does not provide for that control necessary for the best results, nor for the accumulation and distribution of money is necessary to secure the best results. In stating these two facts, I state facts, the truthfulness of which you must appreciate, and you cannot fail to understand that until those defects are remedied, of course the law will not be perfect.

No man realizes the need for improvements, and no man with a given degree of intelligence is more likely to discover suitable methods of improvement than the man who is brought into direct contact with the thing which is to be improved. Then, the statements that Mr. Seymour has presented to you are worthy of your earnest consideration and, if I had time to dwell upon this, I would like to go over the subject item by item. But I wish to say that the importance of having the hearty co-operation of every citizen of the State cannot be too fully emphasized, and the importance of having the hearty co-operation of every health officer of the State is also important; and although it is true that, as President Schurman said, you do not know much, and that for ignoramuses you make a pretty attractive bunch, it is true that high as President Schurman's ideal is, and fully as we all recognize it, and would be glad to attain to it, yet for the present and to-day, the best we have is the humble health officer plodding on as best he can. And in his little community there is a bunch of taxpayers who have accumulated something of this world's goods, and they believe that old fool of a doctor knows something. And they are influenced to a degree by what the health officer says, and because that is true, it opens to you a field for action. It gives you an opportunity to say to your individual patients and taxpayers and assemblymen and senators, "Men, the time has come for us to rise in our might and do our best. And in our respective spheres strive to do away with some of those preventable diseases which have made us share with others the sorrows of untimely death, and made us partners in the great national losses which have come as a result of inefficiency in our health laws."

THE CHAIRMAN — The next paper is by Dr. Marshall L. Price, Secretary of the Maryland State Board of Health, on "The Registration of Tuberculosis."

Our tuberculosis laws, I am sorry to say, are not being carried out as they should be, and I know you will be glad to hear Dr. Price speak on this subject. Then you will understand the point I made, that New York is not, as it should be, the foremost State in the world in this field of work. Dr. Price has come from Baltimore to explain how he has carried on his effective work, and I am glad to be able to present him to you.

THE REGISTRATION OF TUBERCULOSIS

BY MARSHALL L. PRICE, M.D.

Secretary, Maryland State Board of Health

In addressing this distinguished body of sanitarians on a subject of so much importance to the public welfare, I must apologize in advance for saying many things which to you will be mere platitudes, but which are of sufficient importance to merit reiteration. On the other hand, to give a proper idea of the subject I must extend the scope of my address somewhat beyond the boundaries which its title indicates. No anatomist can give a proper idea of the functions of the arm by a mere description of the amputated specimen, but must describe also its anatomical relations to and correlated functions with other parts of the body.

In like manner, and for the same reasons I must touch briefly upon registration in general and the registration of communicable diseases in particular, to give a proper idea of the functions and relations of the registration of tuberculosis with registration in general and to properly fix its place in the body politic; for it is my purpose to show that the registration of tuberculosis is not only the logical growth of the registration of other communicable diseases, but it is a part of the great national movement for the conservation of our natural resources first among which in importance and value is our population.

It is unnecessary to recall to this audience that registration is the fundamental and essential step in the control of communicable diseases, and must necessarily precede all other measures of control, but we do not all realize the magnitude of the step which has been taken in the registration of the chronic communicable diseases, as against the registration of the acute communicable diseases, with which sanitation dealt exclusively in the past. This step is in fact the significant feature of the widespread legislation for the registration of tuberculosis and the means of control dependent thereupon.

We can understand better the attitude of the enlightened among officials and the public toward the registration of tuberculosis at

the present day by comparing the attitude of the same class of officials and the public in the past, toward the registration of the acute contagious diseases.

In the United States registration has been of comparatively recent growth, and its progress has been difficult and slow. The reasons for this are, I think, not hard for any student of national life and customs to fathom. Registration, like other sanitary advancement, is particularly the product of civilization, and the United States has not been in the past a highly civilized country, nor are the Americans now a wholly law-abiding people. I am not lacking in patriotic pride for my own country in making this statement. The general public is prone to regard the term "civilization" as synonymous with high mental and moral development, and this mental confusion has also clouded the minds of some of the historians. History does not bear out this view. Civilization must be regarded merely as an intensive and specialized mode of life, and many distinctly second grade nations have established comparatively high civilizations. A pioneer race such as the Americans, fully occupied with the struggle to maintain individual life and the perpetuity of the race, against human enemies and the hostile elements of nature, could not be expected to devote much time to the problems of how to make life more happy and prosperous; and it is really only in the past few generations that the nation as a whole has taken up the serious consideration of these problems. The vigor and strength of the American people has proven that it is not always the most intensive life that makes for the highest development, and the nation which has like all pioneer nations been wasteful of its natural resources and indifferent to the value of human life has now entered on the second phase of its existence and is now developing what we hope will be the highest civilization of the world.

In the registration of tuberculosis and its legal regulation, the United States is far in advance of the older countries as anyone must acknowledge.

To show that the registration of communicable diseases, even of the chronic communicable diseases, is founded in ancient custom and is not a novel or radical idea, I will cite an example from the sanitary laws of the Book of Leviticus (about 1500 B. C.),

In understanding the meaning of this somewhat obscure paragraph it must be remembered that the form of notification prescribed by the sanitary laws of Moses was by verbal information to the priest, or the presentation of the patient for his inspection. The priests in Palestine in addition to their ecclesiastical duties were also physicians and health officers. The word "unclean," though it had several different meanings, was generally synonymous with "disease." The following is the quotation taken from chap. 5, 3, of the Book of Leviticus:

"Or if he touch the uncleanness of man whatsoever uncleanness it be that a man shall be defiled withal, and it be hid from him; when he knoweth of it, then he shall be guilty."

The fine for this offense was a female lamb or kid of the goats.

Though tuberculosis is not described in the Book of Leviticus, it seems probable that it was recognized as a contagious disease and as such notifiable from the following passage (Lev., chap. 15, 8):

"And if he that hath the issue spit upon him that is clean, then he shall wash his clothes, and bathe himself in water, and be unclean until the even."

The word "issue" in this quotation evidently corresponds to the anglo-Saxon "discharge," or when used as a noun, to the word "pus," and apparently includes discharges from the internal organs as well as from the skin.

The most complete and explicit provisions of the sanitary code of Israel were directed against leprosy, a chronic disease similar in many ways to tuberculosis and caused by an organism very similar to the tubercle bacillus.

It is somewhat remarkable that this sanitary code should have had so few references to the acute pestilences which swept the country at intervals, but it must be remembered that Judea was an isolated country surrounded by a desert and that these pestilences came and went like a storm and were consequently regarded as "visitations" against which human efforts were powerless. On the other hand, leprosy being a disease contracted by close contact and always leaving visible marks, the spread of the disease from endemic centers must frequently have been a matter of personal observation.

To illustrate the attitude of the mediæval officials and public toward the registration of communicable diseases, I will cite the ordinance passed by the Lord Mayor and Aldermen of the city of London which went into effect July 1, 1665. It will be noticed that the notification of communicable diseases in mediæval times was generally enforced only after an epidemic had appeared and had done all the damage possible. This attitude of mind still seems to linger in the minds of many of our law-makers and officials, not to mention a certain class of the medical profession. This fine old classical example of locking the stable door after the horse escapes reads as follows:

"The master of every house, as soon as any one in his house complaineth, either of blotch or purple, or swelling in any part of his body, or falleth otherwise dangerously sick, without apparent cause of some other disease, shall give knowledge thereof to the examiner of health within two hours after the said sign shall appear."

The ordinance in which this section appears was passed under the authority of an act of Parliament entitled "An Act for the Charitable Relief and Ordering of Persons Infected with the Plague." As already noted, this ordinance was passed and enforced when the epidemic of plague was widely disseminated in London, and when it consequently could not have been expected to accomplish very much good.

It was only to be expected that the persistent opposition which appeared when the first attempts were made to register the acute communicable diseases should reappear, though in lesser degree, when the registration of tuberculosis first became established in our statute law. Practically the same arguments were advanced against the registration of tuberculosis which were advanced when the registration of the acute communicable diseases were first provided for by law. I have already cited the old mental attitude toward the registration of communicable diseases, but as all these old arguments have been advanced as new, it is well that we take them up in their special relation to tuberculosis. The arguments against the registration of tuberculosis and the opposition to measures of control fall under two heads: First: General opposition from the public. Second: Special opposition from the medical

profession. Curiously enough in my experience the arguments against the registration of tuberculosis, even those of medical men, are largely founded on this theory of public opposition. Maryland was the first State to adopt a State Registration Law, and at the time the following predictions were made by some of our medical prophets:

1st That the public would be opposed to the registration of tuberculosis.

2d That patients would be opposed to having their cases registered.

3d That the Registration Law could not be enforced. In the light of five years' experience I am constrained to believe that even prophets may occasionally arrive at wrong conclusions, for the following reasons:

1st The public is not opposed to registration, but on the contrary is heartily in sympathy with the movement.

2d The opposition of the patients themselves, either has not appeared at all, or is such a negligible factor that I have never been compelled to give it serious consideration. In fact many patients register their own cases and receive the State supplies.

3d The Registration Law can be, and is enforced. I have reason to believe that practically all of the cases of tuberculosis now in Maryland are registered and our files include every class of case, from the colored day laborer up to the millionaire.

The most serious charge that has been made against the registration of tuberculosis is that it is an infraction of "personal liberty." This charge is strictly true. Every advance that has been made from savagery to civilization, has been made through infractions of "personal liberty." In civilized communities the "personal liberty" of an individual to carry away his neighbor's wife or daughters is restrained by law. The law likewise restrains the "personal liberty" of an individual to carry away his neighbor's goods and money merely because he desires their use. We can imagine one of the old barons growing red in the face with virtuous indignation at the passage of a law preventing him from killing and robbing his peasantry. As I am not very familiar with ancient English I hope I may be pardoned for giving the baron's remarks in colloquial English as follows: "This here

law ain't no good. It's nothing but a fad. I guess what was good enough for my father and grandfather is good enough for me."

I hope I have sufficiently shown that the alleged public opposition to the registration of tuberculosis is largely a figment of the imagination. This leads us to the really serious obstacle in the registration of tuberculosis, namely, indifference or opposition on the part of the medical profession. The source of the most serious difficulty with the medical profession is the code of medical ethics or rather a perversion of that code. In the relation between the patient and his physician, our code of ethics, and indeed the statute law of many States, recognizes that certain information which comes to the physician through his professional relations with the patient, must be held inviolate. This we must recognize, but within certain limits only, as a just and proper law whether written or unwritten; but it is bad ethics and bad law to hold, the individual's rights superior to those of the State. If the code of medical ethics holds that "the rights of the patient are always supreme over those of any other individual, class or community," such a code is a bad one and should be substituted by a more civilized code, namely: "The rights of the community are always supreme, the rights of the patient are only supreme as long as they do not involve danger or damage to the community." The "reductio ad absurdum" of such a code would be to hold that, as far as the physician is concerned, no one but the patient has any rights which the physician need consider; or that to guard his patient against the trivial and generally apocryphal injury of registration, the physician is justified in sowing disease and death among the innocent individuals of a community. The best remedy against this state of mind is to provide by stringent statutory enactment for the secrecy of the records and against their improper use. This provision is in the Maryland law and is also in the laws of New York State. It is thoroughly enforced in Maryland, as I hope it is, and will be in New York. I have been prepared in my own State, when records of tuberculosis were demanded by the courts for legal purposes, particularly in civil suits, to employ a lawyer and to defend the secrecy of the records to any extent short of going to jail for contempt. I merely mention this because a) health officers are not equally careful. In

one of our large eastern cities some time ago one of the employees of the city laboratory was discovered selling the names of tuberculous persons in whose sputum the tubercle bacillus had been found, to the quack vender of a "consumption cure." This individual should have gone to jail, but escaped with being discharged. I think also the more modern views about the hereditary nature of consumption have done a great deal to overcome this kind of opposition.

I must refer also to the vicious effect of the action of some of the insurance companies in refusing, especially in industrial insurance, to pay policies in death from tuberculosis upon the registration of that disease. This has been done for business reasons and to meet competition and can only be overcome by the passage of laws forbidding the vitiation of policies for deaths caused by any communicable disease. We should make it our business to see that such laws are passed in every State. The insurance companies can then meet the situation on an equal footing by general increase of premiums or by more extensive provisions for physical examinations. The present practice puts a premium on perjury and strikes at the root of accurate registration, and should not be tolerated in any State. I am sure that in Maryland this sort of industrial insurance has seriously vitiated our records of tuberculosis, and I have no doubt the same conditions exist in New York State.

One of the most curious of the obstacles which has arisen to the registration of communicable diseases and which applies with special force to the registration of tuberculosis is the somewhat widespread idea among some of the medical profession that a registration law cannot be enforced unless a fee is provided for registration. No doubt some of you have encountered this peculiar attitude in New York. It is needless to say that such a notion is not recognized by any law, either common or statute. In the class of physicians the argument is especially weak because practitioners of medicine receive special benefits and privileges from the State. In all States physicians are exempted from jury duty and from military service, and in Maryland, New York and now in practically all of the States, physicians are a licensed class.

All the members of a licensed class are prone to hold the erroneous view that the licensing of their trade or profession is done for the benefit of the class, and this view is held by many practitioners of medicine. Nothing could be farther from law or common sense. Although I have before stated my views on this subject, I feel that this mental attitude is such a real obstacle to the registration of tuberculosis that it can do no harm to repeat them. The Constitution guarantees to each individual the right to earn his livelihood according to his own interests and desires. The restriction of an occupation for the benefit of the class is clearly unconstitutional and no individual can be restrained from pursuing the occupation which he elects, unless it can be shown that the pursuit of such an occupation by unskilled persons involves the community in special dangers. For this reason a number of skilled occupations are licensed, because their practice by unskilled persons would involve individuals or small groups of persons in dangers from which they (the individuals), not being specially qualified to pass upon technical knowledge and skill, would be unable to protect themselves. Certain other pursuits must be classified as "dangerous occupations" because their practice by unscrupulous and unqualified persons would necessarily involve the whole community in danger. It is in this latter class that the medical profession properly belongs.

The term "license" thus implies special privilege and special restriction. In the issue of the license by the State there is an implied obligation on the part of the State to accord certain privileges to the licensee and an implied contract on the part of the licensee to obey the laws of the State, and to give the State the benefit of his special knowledge. The State does not license any person to violate its laws. In this particular instance the physician is licensed to pursue a dangerous occupation involving the handling of certain dangerous materials, to wit, infectious diseases, only upon condition that he handles them in a manner conforming to law. The physician is no more at liberty to handle these diseases according to his own whim than is an engineer (a member of another class usually licensed), who has the privilege of bringing dynamite into a village, to make a bonfire of it in the public square.

If the physician could be brought to understand his true attitude toward the community I feel sure that the medical opposition to the registration of tuberculosis would soon disappear, and this I feel is one of the greatest and most important tasks of the health officer.

As regards the practical execution of a registration law I could necessarily have little to say to this audience. Most of you have had far more practical experience than I in the execution of general registration laws, and the registration of tuberculosis is not essentially different from the registration of other communicable diseases, nor do I believe that on the whole it is a more difficult problem. It will take in my opinion about five years to place the law for the registration of tuberculosis on a satisfactory basis in New York State. About two years of this time will be taken up in producing the proper mental attitude among the practitioners of medicine in New York toward what to them will be, at the start, a novel problem. After this has been accomplished, pressure must be brought with increasing strength until all the profession fall into line. We are now ready in Maryland after five years' operation of the law to bring the first prosecution.

After all, in the registration of tuberculosis we are meeting a public necessity with a public solidly behind us. With this at hand all other elements of the struggle are of minor importance.

THE CHAIRMAN — This question is one of particular interest here. The State of New York is attempting to put in force a new law for registration. Dr. Price says it will take five years. I do not feel that his estimate is quite correct there.

The paper is now open for discussion, and we will call on Dr. J. P. Wilson, of Poughkeepsie, N. Y.

DR. J. P. WILSON — Mr. Seymour says, "Come up here where everybody can hear you." There are many things the health officer is called upon to do, that he is not paid for; and I was not paid to fill this hall.

Dr. Price has gone over this subject from the time of Moses down to the present time, and so the remainder of the story is very short.

I assume we all agree that registration of tuberculosis is absolutely essential if we hope to combat the spread of this disease.

Efficient municipal measures directed against the spread of this or any other communicable disease presupposes that the attention of the physical or health officer should be directed to the location of the disease. The necessity of registration may be admitted, for to-day, in almost all of the civilized countries, provision is made for the registration of tuberculosis.

Now, granted that registration is essential, and we have this information in our hands, derived from reporting the cases, still our work is not finished.

It is not sufficient for us to sit in our offices and send three printed leaflets to the afflicted ones; nor is it sufficient to notify physicians that tuberculosis continues to be a reportable disease; nor is it sufficient for our local boards of health of the State to petition our legislators to interest themselves in bills that may be pending before the Legislature. All these measures are admirable and essential, and they have their place in a campaign; but their place is not in the front rank of the forces drawn up for the fight.

I spoke of our lawmakers. Do you know we are a peculiar people in that we relentlessly and continuously and unmercifully abuse our lawmakers, and yet we continually run to them if we desire their influence in passing some legislation that to us appears to be important.

But we may legislate and legislate until the crack of doom and accomplish but very little. What we need is education: education of the people and of a few of the physicians. In fact, I may say that the paramount needs of this campaign are funds and education, and not research and legislation. At the meeting in Syracuse Dr. Porter said you cannot change the customs of the people or inaugurate any great reform unless you have behind you a determined and intelligent people. That is what we need in this campaign most of all—a determined and intelligent people.

We may legislate and we may legislate until Gabriel sounds the reveille and, unless the people have a working and saving knowledge of tuberculosis, we accomplish but little. You say: What has all this to do with registration? Simply this, my friends: I want to point out the relative importance of registration and education. If the people understand the nature of tuberculosis then registration and all other executive measures will follow as naturally as night follows day. The importance of registration is apparent. It is impossible to successfully fight a concealed enemy. In order that these unfortunates may be benefited by modern methods, it is necessary to know where to locate the disease. Tuberculosis is a preventable disease. It is quite possible to fight it. We can send food and other necessities of life to those afflicted with tuberculosis, and after death we can renovate the quarters.

We have learned of the danger of Typhoid Mary; and Mary has been considered a menace to the community. Now, every concealed case of tuberculosis is likely to be just like Typhoid Mary. There should be some surveillance of these by the Board of Health.

In order to successfully combat the spread of this disease, it is necessary that compulsory notification shall apply to all open cases of the lungs and the larynx.

I presume cases are not reported for several reasons. One is, that certain physicians fear that the Board of Health, through its health officers, will encroach upon their domains. That is a feeble excuse, because these cases frequently drift from the first physician who sees them—you know that as well as I do—and it is less difficult to exercise a supervision over a case if we once have had the case reported to us. Then again, some physicians fail to report their cases because they are indifferent, there is a lack of harmony between them and this general tuberculosis propaganda. They need some of the education I spoke of.

Then again, some physicians think their whole idea in the practice of medicine is to consider the patient and his interests only—entirely forgetful of the public and its interest. This is all very well for those physicians who still practise medicine, who still treat their patients. But there is another class of physicians forgoing to the front, who are practising public and preventive medicine.

Now, my friends, after all has been said and done, the progress of the campaign against tuberculosis will be accurately indicated by the marks made by the rising tide of the sum total of the education of the people.

THE CHAIRMAN—Is there any further discussion on this paper?

DR. ———— I think there is a good deal of ignorance among physicians relative to what is ^{really} demanded of them concerning this registration. Living in simply a town in the truly rural community, as I do myself, I do

not know what my duty is, and I am sure the law is not explicit in those things. I have recently heard that about eight miles from where I live there was a person afflicted with tuberculosis without a physician in attendance. What is my duty under such circumstances? May I drive there, drive over there eight miles, and examine and see if there is tuberculosis there, if there is no physician in attendance? Many of these things are practical questions, and we would like to know what we are expected to do under such circumstances?

THE CHAIRMAN — Mr. Kingsbury may say a few words on that.

MR. KINGSBURY — Fellow Health Officers, I feel like saying, but I do not know just what relation I bear to health officers, as I have but a general interest, the interest of a promoter of propaganda in this matter, but Dr. Goler said last night I was a promoter, so I appear in that role, as one who has had some hand at promoting this law under discussion, and one who has studied assiduously, and with much profit, the Maryland law in drafting this law.

We gathered together the laws from all States and all the sanitary codes in all the leading cities, and the legislation of foreign countries in the preparation of this law. I was greatly impressed with the splendid paper and the excellent discussion by Dr. Wilson. The discussion is what is needed to bring out the points of the law, and to impress upon everyone the real rub in this matter — that is, the education of the public, and getting the public back of the health officer in enforcing this law.

The registration itself is, we believe, of great value from the educational standpoint, and so that is the reason for endeavoring to get the Legislature to enact a law which may be and perhaps is somewhat Utopian.

The next thing is to follow cases up, and not simply take the advice of a layman as to what should be done, but to go to a physician and find out what should be done. Follow the cases into the home by a visiting nurse, and do something for them. Now, there are two things in that law I would like to call to your attention. One is the provision requiring the protection of the records as to which Dr. Price referred. If you will read that section carefully, you will note it says these records must be protected, but can be used in the discretion of the health officer, for the purpose of enforcing the provisions of that act.

Now, recently I had a discussion with a health officer who maintained he couldn't use those records for any purpose. If that is the case, he cuts off the relief of charitable officials and hospital officials in getting hold of the cases and getting them segregated. So, if you will read the law carefully, you will find that the health officer, while forbidden from giving undue publicity to the cases registered, can exercise his discretion in the use of those records. I do not think that has been made quite clear in the past.

Now, the other thing is, in answer to the question asked as to what power the health officer has: I think if you will read section 3 or 4 — it was section 8 before the consolidation of the law — you will find the health officer is given almost unlimited power. Dr. Biggs was responsible for getting that into the law, and he said at the time that would give to the local health officers, as in the case of the health officers in New York City, almost unlimited power, for in New York City they can take them out of their homes and segregate them on North Brother Island in poor cases.

Where the case is not receiving proper care, and the members of the family are not receiving proper protection, it becomes the duty of the health officer, and it is his right to go into that house and enforce such measures for the protection of that family, as in his judgment are proper in the premises. And furthermore it specifies, whenever a case of tuberculosis comes to the attention of the health officer, if there is no physician attending the case, the health officer has the right to enter and carry out the precautions mentioned in

that section of the law. So, I think by careful examination of the law, you will consider that the health officer is given the power to do all that is necessary to carry out the procedures and the precautions in homes where there is tuberculosis.

Now, in regard to the educational side of this case: As promoters, it is not our desire to interfere with the work of health officers, but to co-operate with them and educate public opinion, and health officers in the cities where we have been will testify that is the work we have done. We create a public opinion which gives more respect for the health officer, and the most important arm up there of the government is the arm which deals with the health of the community and the lives of the people.

Dr. ———— I have had occasion to visit a family reported to me as having tuberculosis. A member of this family felt they should not be encroached upon. She was sick and it was nobody's business but her own, and she did not see why the matter should be made public. I told her it was not made public; I came to see her, as the case had been reported to me, and it was my duty to come and counsel her, and not to meddle with her private affairs. She was an irritable woman, and I had great difficulty in soothing her irritation. She was unwilling to comply, but she finally consented to use the means which I had acquainted her with. She told me there was a family not far away from her that had tuberculosis, and asked me if I had visited them. I said, "No. Do you know they have tuberculosis?" She said she was not sure, but she thought they had as they were poorer in flesh than she was. At any rate, she became reconciled later to the requirements of her situation.

I think an embarrassing situation exists there, namely: That if the health officer, while he makes a record of the case must conceal that record, must avoid making that thing public, and has to report it—now whether that is publicity or not may be a question that the patient may bring up; and if it is made public he is subjected to prosecution for a misdemeanor.

Now, it may be that many health officers and boards of health may be at a loss to know how far the talking of these things and reporting of them subjects them as individuals to an action for violating the law and subjecting them to a fine of \$100.

I am at a loss to know in this case of this woman that I called upon; I did not see any record anywhere that I had the right to enter upon this family. The case had not been reported to me, and to-day, while this does not constitute an infringement of the law, that would not be safe for me to undertake. This case is in Kendall, Orleans county, of which I am the health officer.

THE CHAIRMAN — I think Mr. Kingsbury and I had better get our heads together and prepare a circular covering some of these matters. Something which the doctor can put in the hands of the patient, and not give the health officer all the blame for construing the law himself.

Dr. ———— I believe in the suggestion of the committee, that someone should be appointed to look into the law and make timely recommendations. Many things in the law can be met with advantage. I know the health officer is in duty bound to enforce the law. But any municipality that does not give sufficient funds to enforce the law is in itself guilty of a misdemeanor. In Buffalo we had some difficulty—the board of aldermen would not give us the inspectors and the clerks necessary to see to the enforcement of the law. Finally, after several months we threatened to mandamus the board of aldermen to provide the means to enforce the law. They then gave us \$5,000 to enforce the law. We have lectures and circulars in four languages, and we see that the law is enforced. The only thing is: do not be afraid of enforcing the law. When you find a case of tuberculosis see that the patient does what the law demands. Do not hand him a circular and think you are through with him. If you cannot see him again, send an inspector or a district nurse there every two weeks, and see that he takes precautions not to infect the

members of his family and the neighbors around him. With this law we should know all the tubercular patients we have in the State of New York.

Our inspectors every day see the cases and they investigate the homes, and if the conditions are found to be insanitary, they make a report to us, and the inspector goes there and sees that the room is changed, or that ventilation is given, or we go to the workshop and see the managers and employers of the men and they are generally willing to co-operate with us.

Above all we must not be afraid to act. And in the course of time we will have a very good state of affairs indeed.

THE CHAIRMAN — The Conference will now adjourn until 2 p. m.

THURSDAY, NOVEMBER 11, 2 P. M.

FOURTH SESSION

SECTIONAL MEETINGS

Presiding, ALEC H. SEYMOUR.

THE CHAIRMAN — Gentlemen of the Conference, there was one paper on our program this morning which could not be taken up. It is by Prof. Ogden, and will treat of the Cornell Sanitary Laboratory.

THE CORNELL SANITARY LABORATORY

By H. N. OGDEN, C.E.

Special Assistant Engineer, State Department of Health

I had this morning a carefully prepared paper, and what I hoped was a most eloquent speech in relation to the State Hygienic Laboratory at Cornell University. I had expected to speak anywhere from one-half an hour to one hour, describing in glowing colors the possibilities of that laboratory. But now when I am treading on the time assigned to other speakers, I am warned that I must be most brief, that I can only have a few minutes to tell you what we are trying to do in that laboratory.

I have traveled back and forth over this State for the Department of Health now for three or four years, and I am more and more impressed with the size of the State the more I travel. Whenever I have to go from Ithaca to Olean, Salamanca or Jamestown, or strike that local train that runs west from Hornell, I wish the State were compressed into one-half its size, and when I take the Delaware & Hudson train from Binghamton to Albany, I want to cut the State in two. The State is too big for a man that has to travel very much over it.

You, as health officers, who have had occasion to send samples of water to Albany, or specimens of sputum or blood, or any other object for analysis or determination, have also regretted the size of the State, owing to the time necessary to get results from that examination.

Only yesterday I was talking with a gentleman from a certain part of the State who had sent a sample of water to Albany, and

he told me he had been promised the result of that examination in two weeks, and with a shake of his head, he said "It is now four weeks, and I do not know how long it will be before I get the results of that examination."

But what can we expect with 8,000,000 people, 1,400 health officers, sending water to one station, and that station eight, ten or twelve hours distant from many of those places, by rail.

It seems to me the State should be divided into districts. It is foolish for men in Chautauqua and Cattaraugus counties to send to Albany to know whether a case of typhoid fever can be diagnosed as such, or whether water from a well in Dunkirk is polluted.

The basic principle of this laboratory work is the separation of the State into districts, wherein shall be one laboratory for the care of that particular district, and this is the beginning of that plan. The central portion of the State has been adjudged one district, from Oswego county on the east to Wayne county on the west; and from the north down through the State to Broome county, Tompkins, Tioga, Chemung and Steuben counties. Surely that is enough to maintain one laboratory. In that district there are ten cities and eighty-nine villages of over 500 people each, and I feel if we keep control of the water supply of that district, we shall have our hands full.

Through the co-operation of Cornell University and the State Department of Health, the laboratory was established this fall. It is now at work. Last night two samples came in and I put them on the ice as I had to come to Rochester. Our plan is to analyze the water supply of every one of these villages and cities once a month, and if any suspicious water is found, oftener than that. We will be able to tell the health officers immediately whether any water is open to suspicion. In the course of time we hope to send out supplies of anti-toxins, to have diagnoses made, to send out literature, and to have our medical experts there in case of epidemics. At present, we are limited to the analysis of water, and as I say, we must carry those analyses through the district once a month.

One other point: Being so near the villages, we want the health officers to become interested in the work of the laboratory. I

would like to put myself at the disposal of the health officers who would care to come to Ithaca, to see how the work is done, and to find out why the water is said by the chemist to be bad. We sometimes do not believe the chemist, but if we could see his process, and on what he bases his conclusions, we would have more respect for his conclusions. That is the laboratory we are starting, the Sanitary Laboratory of Cornell University, that is at the service of the health officers in that central district, limited by the counties which I have mentioned.

THE CHAIRMAN — The State has been very fortunate in securing the services of Dr. Howe as its chief medical expert. He is going to talk to you this afternoon on the "Prophylaxis of Communicable Diseases."

DR. WM. A. HOWE — Mr. Chairman and Health Officers, I feel more like getting down among you, on the same level with you of the floor, where I have been for twenty years. It seems to me, coming so recently from the ranks which you yourselves are gracing, that I would like to touch shoulders with each of you. I feel more like having a good hand-to-hand shake, a good heart-to-heart talk with the health officers of this State, than I do like presenting my carefully prepared paper.

Now, my one desire and ambition, as a member of the Department of Health, will be to meet so far as possible every health officer of the State of New York, and, wherever possible, to lend every personal and official assistance I can to assist them in adjusting their local differences, and to improve their service to the people they represent.

PROPHYLAXIS OF COMMUNICABLE DISEASES

BY WILLIAM A. HOWE, M.D.

Medical Expert, State Department of Health

A general consideration of the prevention of communicable diseases is far too comprehensive to admit of more than a brief consideration, in the time allotted to my disposal.

Before attempting even this, it might be well to first acquaint ourselves with a few statistical data which have a most significant relation to the question in hand.

By consulting the records of the vital statistics of the State Department of Health, we find that during the past ten years no less than 221,853 people have died from preventable diseases.

This means that during the past decade, 32,565 more people than to-day comprise this beautiful city of Rochester have lain down their lives from diseases which ought to be largely prevented.

It also means that unless we can succeed in materially reducing the mortality among these diseases during the next twenty years, nearly one-half million precious lives will pay the penalty of our failure.

It likewise means that with the present death rate unchecked for twenty-five years the State would lose from the same source, approximately, the equivalent of the combined population of the cities of Rochester and Buffalo.

Does not such a startling fatality among our people seem almost appalling? Does it not seem as if there ought to be some means by which this awful sacrifice of human life could be checked?

Does it not seem as if, with our increasing knowledge along bacteriological and hygienic lines, aided by public sentiment, we ought to be able to avert this impending calamity?

This condition prevails, not from any one cause, but from many. It prevails in spite of the well recognized fact that the State Department of Health, together with its efficient health officers throughout the State, are putting up a splendid fight against mighty odds.

To some it might look as if we were either unable to meet the situation, or indifferent as to its fatal consequences.

To the medical profession it might be a sad reminder that as yet there has never been a united effort among its members to stamp out these destructive diseases.

To the health officers it might furnish abundant justification for the adjustment of many petty local feelings which often impair the hygienic welfare of a community.

To our Governor and our legislators, who have been so kindly disposed to supply funds with which to guard the health of the people, it might be a further incentive to even more liberal financial encouragement. With the public, already so widely and wisely concerned in matters of health, it might well arouse a determination to take a more active part in this struggle for self-preservation.

Be this as it may, the barren fact remains, that death from preventable diseases is each year staring into the hopeful faces of over 22,000 helpless people in our State.

What is the remedy?

Are the people willing to see us, or are we as health officers and physicians going to be content to sit down and meekly view this gigantic funeral procession as it passes through our midst?

Are we going to acknowledge defeat by this grim conqueror even before the battle has scarcely begun?

Are we going to admit that the combined energies of the sanitary forces of the State, the medical profession of the State, and the people of this proud State, are helpless before the invasion of communicable diseases?

Such does not seem possible, nor should it be.

What we need and must have here is a union of forces, before whose combined energies these diseases could not long endure.

Were this accomplished, do you think it would take us long to suppress ophthalmia neonatorum, a disease apparently so easily prevented?

With this union *army as it were,* *waging a war of extermination on disease, how long, under the leadership of our energetic Commissioner, would it take to revolutionize the vital*

statistics of the State, and place us foremost in the nation, yes among nations, as preservers of health?

Indeed it would not be long, and who would rejoice more than we to lead in this fight, which can but preserve millions of precious lives to the State, save untold riches to her resources, and make us the benefactors of a grateful people.

Health officers of the State, brilliant possibilities lie before you. Your faithfulness in the past is ample assurance of your devotion to the future. With such devotion to duty, let us hope that each of you will, (1) cultivate a cordial relationship between himself and his associate physicians, thereby insuring to the State the complete and prompt report of all contagious and infectious diseases; (2) gain the confidence and support of the public, in the establishment and enforcement of all sanitary laws; (3) enlist the active co-operation of all educational institutions, e. g. the press, the churches, the schools, colleges, or universities, and social or literary bodies, in teaching the fundamental laws of health.

Keep Commissioner Porter well informed as to your local sanitary conditions, never forgetting that his one desire is to serve you and through you the people.

Let us further hope that neither you as health officers, nor we as members of the department, will ever lose an opportunity to widen our acquaintance, not only among ourselves, but among the physicians of the State.

This may perhaps impress some of you as being rather foreign to the subject under consideration, but in it and through it lies one of our greatest opportunities to achieve success in the prophylaxis of communicable diseases.

Much as we may regret to admit it, it is nevertheless a well-known fact, that as yet the medical profession has not been unanimous in its support of the sanitary officers of the State. This unfortunate condition can and should be entirely different.

We want to appeal to you, as an integral part of the department, to interest your fellow practitioners in this splendid work. Get them to attend these conferences with you, and to participate in their deliberations. Make them to feel that they too are a

part of us, and are welcome among us. That to them as well as to us will belong the final credit of success.

Get them to resolve with you, that however brilliant may seem the achievements of the past, they will pale into insignificance under the united forces of the future.

Abolition of the common drinking cup.—The common drinking cup, so long in use in our schools, our churches, our public buildings and institutions, our municipalities, our railroad cars, and elsewhere, is to my mind one of the most prolific sources of spreading certain communicable diseases, particularly tuberculosis. This relic of the age of infection can and should be abolished. You as health officers can do much to accomplish it, and it is plainly your duty to wage a war of extermination against this menace to public health.

The clinical thermometer, a source of danger.—Practically all of you are in general practice, and are the busy men of your locality.

In most instances you represent the most advanced thought, not only in modern sanitary science, but in the profession to which you belong. As general practitioners, as family physicians, or as health officers, I would like to ask:

How many of you as a routine practice use more than one clinical thermometer in your daily work? How many of you use more than two?

How many of you have ever used a thermometer in the mouth of a patient, which you would not put into your own?

How many of you have had a patient hand this instrument back, with a polite request that you again cleanse it?

Do we not as physicians owe as great care in this matter to our confiding patients as we exact for ourselves? Are we always faithful to this trust?

A few years ago, Dr. Conklin of Dansville, assisted by Professor Dodge of this city, conducted a series of experiments with thermometers cleansed by the methods ordinarily employed. The result of this investigation was subsequently given by Dr. Conklin before the Central New York Medical Society, and clearly showed that this indispensable instrument is liable to be a frequent carrier of germs.

Such is undoubtedly the case, and it would seem as if we might and ought to adopt some method by which we could eliminate this needless danger to the people intrusted to our care.

Let us all at least resolve that we will never again use this instrument with a patient, unless we would unhesitatingly use it on ourselves.

Anti-tuberculosis warfare.— Neither the history of medicine, nor the history of mankind, furnishes anything approaching a parallel to the present fight against this one disease.

Its battle field reaches from ocean to ocean, from sea to sea, from continent to continent, and from civilization to civilization.

Its opposing forces are the numberless billions of bacilli on the one side and an afflicted people on the other.

The struggle, which has been a most desperate one, shows no signs of an early abatement.

With one single patient expectorating each day more tubercle bacilli than the total population of a nation, is it to be wondered at that the odds are so overwhelmingly against us, or that our progress should be so slow, and often so discouraging?

But notwithstanding these seemingly insurmountable obstacles, the human race is destined to win in this fight for its very existence.

I verily believe that the time will surely come when we will control this great white plague as effectually as to-day we control smallpox, which in prevaccination days wrought such frightful havoc with the human race. To accomplish this end many things are absolutely essential.

Let me assure you that in my opinion the great physician of the future is destined to be he who prevents, rather than he who endeavors to cure, disease.

Let me again emphasize the one pervading thought of my remarks, that the prevention of disease is a far greater victory than to treat the same.

Viewed from the standpoint of the sanitarian, ladies and gentlemen, the future of preventive medicine is indeed most promising.

It is the most vital and practical of all health problems which are to-day sweeping like a tidal wave over the civilized world.

Its rapid growth and evolution is being augmented by many

of the brightest and ablest minds of the age. Like the fresh air of the heavens, it is God's means, placed at the disposal of the human race, and is but another of His wonderful blessings. It is but the corner-stone on which we must eventually build the superstructure of our sanitary laws.

As physicians, as teachers, as advanced thinkers, as custodians of health, as firm believers in its possibility of accomplishing wonderful things, we should welcome its coming, and spread its blessings.

Unless we can find some reliable means by which we can destroy the insidious bacillus outside the body, or render it inert after it gains admission to our system, we must continue to struggle against mighty odds.

With tuberculosis, more than with any other communicable disease, prevention means most to the ultimate success of its extermination.

Unless we can stop the multitudinous exposures which are occurring daily, we cannot hope to prevent the incipients, nor to find ourselves without the more advanced cases.

Let us therefore strive first to prevent, but failing in this let us learn to find our cases early and then, if possible, cure them.

Let us all unite in a common endeavor to locate and register every case of tuberculosis within the State.

Let us educate the people from childhood to manhood as to its dangers when carelessly handled, and inform them as to its comparative safety under proper management.

Let us advocate the location, throughout the State, of suitable sanatoria, in which cases of varying stages can be segregated, and receive the latest and best attention.

Let us favor such legislative measures as will best enable this work to be carried on most advantageously.

Let us advocate State or municipal inspection of our schools, our churches, our public and private institutions, our railroad cars, our factories, in fact all buildings in which many persons assemble, to ascertain whether or not conditions exist which may jeopardize the health of our people.

Ophthalmia neonatorum.—The long continuance of this need-less calamity among the children of our proud State should bring

a blush of shame to the faces of those who usher these helpless little ones into this world so full of sunshine and happiness.

No person with a human heart can see a child doomed to a life of darkness and be unmoved by the horror of the spectacle. Nor should any person, man or woman, who assumes the awful responsibility of the parturient chamber fail to realize that this awful calamity may some day be laid at his or her door. It is true that the vast majority of you have been fortunate thus far in escaping. Grateful indeed should you be, and yet let me pray that you may never relax in your painstaking care to the eyes of the infants which are intrusted to your safety. Fortunate yourselves in knowing how to prevent this needless affliction, you are the very ones to assist us to teach others, less fortunate and less successful, how they too may escape.

By this time there ought not to be a health officer in the State who is unfamiliar with the policy of the department for the suppression of this disease. The work is progressing very satisfactorily, and with your earnest co-operation we hope soon to be masters of the situation.

Thousands of supplies have already been mailed to the physicians of the State, and the demands for the same are daily increasing.

We want to ask your assistance in our endeavor to secure a card index of every physician and every midwife doing any accouchement work within our State. With this as a working basis we hope to follow closely the occurrence of every case of ophthalmia in the new-born, locate its cause, and if possible prevent its recurrence, in the hands of the same practitioner.

The mere instillation of a few drops of a one per cent. solution of nitrate of silver into the eyes of every new-born infant is a procedure so simple, yet so effective, as to commend its universal adoption by the profession.

More rigid enforcement of quarantine laws.—The fault here is not so much in the law as in its violation or lack of enforcement. In sanitary as well as in civic statutes, many a good law is no better than the poorest, simply because it is not complied with. It matters not how wisely these measures may be drawn,

they are practically valueless as preservers of health, unless we can execute their enforcement.

The law directs or commands that we shall quarantine scarlet fever, measles and whooping cough, and yet how many physicians are there in the State who are to-day absolutely indifferent to its mandates, in respect to one or more of these diseases. We can never hope to save the 3,365 young lives which are being sacrificed each year to these three diseases until we and the people learn to more fully appreciate their imminent danger, and to handle them accordingly. The time has come when we must abandon the ancestral fallacy that these so-called children diseases are harmless, and should, therefore, be had by our children while they are young. As a matter of fact statistics tell us that we lose each year far more from this source than from diphtheria itself.

Let us awaken to the situation, which you must admit is indeed a serious one.

Let us urge you to be vigilant and faithful in seeing that the quarantine laws as they pertain to all communicable diseases in your community be rigidly enforced, accomplishing which you will have taken an indispensable step in saving many thousands of lives otherwise doomed to an early death.

Typhoid fever.—During the past ten years our State has lost 16,091 of its subjects from this one source. Most of these have died in the prime of life, at the height of their earning capacity to the State, and of their greatest usefulness to their families.

In the suppression of this disease, whose ravages are each year costing our State so dearly, let us hope that you will vie with each other and through yourselves with the people, to assist the Commissioner in his determined fight against this destructive disease.

Bring to him every possible aid within your power to stop the pollution of our public waters, the accomplishment of which will do more than any other one thing to reduce the frequency of this malady.

Let him feel assured that you will wage an incessant warfare on the filthy *and* that you will guard assiduously the milk supply to your people, *that you will favor* legislation looking to the State

or Federal inspection of the sources of our shell fish, and that you will keep a vigil eye on all other possible sources of infection, never forgetting to employ the most drastic and effective means to destroy the typhoid germ as soon as possible after it leaves the body.

Diphtheria.— Since the introduction of *antitoxin* as a therapeutic measure in diphtheria, the deaths in our State, from this cause, have fallen from 6,448 to 2,468 per year. This brilliant result is so strikingly significant that it speaks more convincingly of the efficiency of this remedy than one could possibly write in words.

The most rapid decline in this death rate occurred between 1888 and 1898, since which time no such striking reduction has been accomplished.

To be sure the lowest point ever reached in the death rate in our State was touched in 1906. This was again closely approximated in 1908, but since 1898 the death curve has not shown the steady decline which one would naturally expect under the existing favorable conditions for the general employment of antitoxin.

There has never been a time when the State was more generous in its policy or more able to distribute to all needy and emergency cases so reliable an antitoxin as at the present, or during the greater part of the past ten years. We cannot believe that this failure to more rapidly reduce the death rate from this disease is attributable either to the inefficiency of the remedy, or to the inability of the medical profession to obtain it.

The frequent and positive tests to which our *antitoxins* are subjected leave no room to doubt their potency. Our liberal policy of distribution is certainly such as to furnish no excuse for being without them.

This continued high mortality, we believe, will not be found among those of you who are believers in the unquestionable efficacy of this remedy, but among those who either disbelieve in its virtues, or for other reasons refuse to employ it in their practice.

We hope, therefore, you will aid us in an endeavor to reach and convert these unbelievers. That while doing so you will exem-

plify your faith in the precepts of your teachings, by using this remedy of par excellence value, not only as a preventive measure, but in the early and energetic treatment of all cases of diphtheria coming under your observation.

Tetanus.—During the year 1908 we lost in this State 122 people from tetanus. This is far in excess of what it should be and will be if we can secure the general employment of the tetanus antitoxin supplied by the State. It is now generally admitted that in this remedy we have almost a certain means of immunizing an infected subject, from an outbreak of this frightful disease.

Its greatest efficacy is apparently as a prophylaxis, as which we urge its general administration.

Commissioner Porter is anxious that all health officers of the State should watch carefully their supply of both diphtheria and tetanus antitoxin. Make certain that you have a liberal amount of each on hand and that it is not too old for distribution.

He is also desirous that the several hospitals in your localities should be supplied, through you, with a reasonable amount of both these antitoxins for emergency use. With these remedies in your hands, and at the immediate command of the hospitals of the State, we feel justified in predicting even more gratifying results than we have ever enjoyed in the past.

THE CHAIRMAN—We would like to hear from the gentlemen indicated on the program for discussion of this paper.

DR. D. S. ALLEN—It is related at one time when the Duke of York called on the celebrated Dr. Abnerthy, the doctor after hearing his complaints gave the following advice: "Cut off the supplies as the Duke of Wellington did in his campaigns and the enemy will leave the citadel." This statement is an axiom. When this remark is applied to communicable or germ diseases, the question to be solved is how to cut off the supply. Until recently little or nothing has been done for the protection of the school children, children between the ages of six and sixteen. Much has been accomplished for the protection of the babies, but almost nothing for the protection of those of school age in our common district schools. While we compel the attendance, we have done little to safeguard their health.

A leaflet issued by the State Department of Health, entitled "The Teacher and Communicable Diseases" (a copy of which should be in the hands of every teacher), very justly says: "The State provides education and it is by law compulsory, it is therefore the duty of the health and educational authorities to see that the scholar suffers no impairment of health in consequence of school attendance."

In the high schools systematic effort made of our villages and cities there has been a more or less good results have been achieved in enforcing and teaching some sanitary and hygienic laws. preventing the dissemination of many communicable diseases by more attention to the control of infectious germs, but we ought and must pay certain rooms and buildings, compelled as they are to occupy largely of our making. It is surrounded by environment.

our duty to see that they are educated in sanitary and hygienic laws, warning them of the dangers from various sources of infections from communicable diseases. In the first place we should make it a part of our duty to see that the schoolroom is kept in as sanitary condition as possible. Hygiene should be taught and enforced by the teacher, and in many cases the teacher should be instructed by the health officer. I do not think the best results can be obtained by the use of text-books. Place in the hands of the teacher the leaflet referred to and supplement it by judicious advice and an occasional five minutes talk, either by the health officer or by some one adapted to the work, to be agreed upon by the teacher and himself.

In nearly all these schools you will find the water for drinking in a pail, not infrequently uncovered, usually a cup with a short handle, and every time the cup is used the fingers come in contact with the water in the pail, the drippings from the outside of the cup fall in the water, thus subjecting it to or at least giving it a chance to pollute the whole body of the water to be drank by the other scholars. This can be remedied to a certain extent by using a dipper with a sufficiently long handle, so that the cup need not usually come in contact with the hand and the fingers cannot touch the water. A better way is to have a fountain from which the water can be drawn through a faucet.

We have cautioned them against swapping chewing gum, giving a bite from an apple, putting pencils or penholders in the mouth, etc., but is there less danger in using a common cup for drinking purposes? Who of us has not seen an epidemic of sore throat, grip or an influenza of some sort attack nearly or all the school with more or less severity? Is it not probable that it is communicated from one to the other by the use of the common cup? This can be avoided with very little expense to the taxpayers by the use of the fountain and individual cup. I would have each district furnish both the fountain and cup so they would be uniform and no strife or jealousies exist as to who has the best or more expensive cup.

It would be wise to have the water from the well that supplies the school examined at least once each year, at the commencement of the term, both for the purpose of protecting the users of it and for the moral influence in showing that you really have an interest in the health of the pupils.

I would also abolish the common towel as a source of infection, have each scholar bring and use his own. In most of these schools a large proportion carry their noon-day lunch, and usually have a napkin or towel in each box.

Then the child should be instructed in the use of the handkerchief. The teacher should not allow them to cough or sneeze unless the mouth and nose is protected by some sort of a handkerchief to keep the germs from infecting the air of the room.

Spitting on the floor has been almost entirely suppressed, and it would be just as easy to induce the habit of protecting others from coughing or sneezing. You gain by doing this both by teaching the child and forming a habit that will last through life, and the example will be followed by the parents and other members of the family. The average child is a tyrant, and will demand of the parents and other members of the family the precautions they have been taught as healthful and cleanly.

I believe these simple and inexpensive changes can be easily accomplished in our rural schools and thus form a nucleus for better sanitary habits that will cut off the supply to a certain extent of infectious germs.

Now don't go too fast in changing the old order. I find that by talking to a school and suggesting certain changes toward sanitary cleanliness, they very soon fall in line and are ready to adopt, in fact suggest other ideas in this line. You will thus sow the seeds of cleanliness, and after all the whole law of hygiene and sanitation is included in having a clean body, clean habits and a clean life.

DR. E. W. SEVERES — Sanitation interests all of us, and so does prophylaxis; and it seems to me that if some idea can be given of just what is at our very doors, that should be corrected, to prevent the spread of disease, that idea should be entertained, discussed and elaborated. He has as his aid and support, the best medical department in the State. We have learned of the

"inefficiency of the health officer," and the "ignorance of the medical man with regard to health matters," from one of the speakers this forenoon. But we point to our local boards to account for the health officers' inefficiency. First, he may be a coward. That would account for his inefficiency. Second, he has the silent opposition of his confreres. He goes on to do something, and the doctor will not aid him. He goes by this cesspool, sloppail, and so forth, and he never reports it. It breeds flies and the filth is dragged into the houses and into the rugs that have not been cleaned maybe for a year.

Then these doctors do not report to us one-half the cases they know of for fear some other fellow will get their patients. Further than that they do not report to us suspected cases, and especially do I refer to tuberculosis. We have knowledge which would be of special benefit to the patient if the cases were reported. I do not wish to make a speech, but I wish to bring out the idea that there is something which we each should give attention to in our several localities.

We have heard of the contamination of the waters of the State by the sewage. Very true. But perhaps we are fortunate in the fact that there is not enough water drank in New York State to cause anything in the way of disease. The chief source of trouble is the milk supply. I come from the greatest dairy county in the State—St. Lawrence. Hundreds of thousands of gallons come from there. But in other counties we find trouble is traced to the milk supply. The milk supply is the chief source of communicable disease, and if we are to exercise prophylaxis we must look to it. The milk bottle—your milkman comes to the milk depot and is loaded down with the daily supply, and he has say four hundred families to supply and one hundred bottles which he uses in supplying them. He leaves a bottle over at your house, and in exchange he gets an empty one. In your house is a case of communicable disease. The baby is ill. The mother is the nurse, cook, tablemaid and chambermaid. She washes that bottle in luke-warm water, dries it as well as she can on her apron, and the baby is given it to play with, and when the milkman comes, he takes it after she has wiped it with her apron, and he fills it and delivers it to the next customer.

DR. GEORGE STRASENBERG—I think what I have to say is brief and important. It is in behalf of the practising physician. He is reproached very much, and if the conditions were better understood, perhaps they might be more appreciated.

I am from Orleans county, and I will relate to you some circumstances which the practising physician has to come in contact with. A little help from the department will certainly help the health officers. I was notified of a case of typhoid fever. I went in and saw the man, looked at the surroundings, and saw that the conditions were quite sanitary. I told the lady in whose family one member had typhoid fever that it was necessary for me to call in the officials and clean the house. She railed against me with the utmost of her strength, and threatened me with the law, and said she knew the town would have to bear the expense, but she said, "If I put such an onus of that kind on her house"—she said, "How did you know I had typhoid?" I said, "The physician informed us. She railed against the physician then, and intimated that she would not have anything to do with him again. I had quite a time with her to allay her passion. I told her it was my duty to come and inspect her house and the outhouses. She said she would send the patient away to such and such a place. I said, "It is no difference. It is necessary that you should keep this place in such and such a condition." Now she berated this physician.

Now, Mr. Chairman, this physician has prepared himself for his profession, and it has cost him money, and he finds that this family and the other families are rising against him because he does this duty. There is a possibility that he might refrain from promptly notifying us when such things exist.

The case of tuberculosis which I referred to this morning, I failed to state in that—but this lady who is so afflicted is an educated woman and the doctor in our city, and she is full of fire as a volcano, and you may imagine that with her fire she has determined, and I felt I could not threaten her with.

anything. I talked with the sister of this woman the other day, and asked her if she had used the articles which I had furnished. She said: "Yes, but she does it very reluctantly, but some things she said she wanted." She said, "What shall I do?" I said, "I do not know." She said to me, as I furnished her with documents, "Perhaps all you could do would be to bring her before a justice of the peace and fine her. She has money."

I tried to persuade her, for her own sake, that all these requirements were but to advance the interests of the person who was sick.

Now, if the department gets more money from the the next Legislature and they will publish or print a little pamphlet, stating all the diseases that are communicable, and the precautions which should be taken in each, I will undertake to send a copy of it to every family in town and it will help them to know when the physician comes to attend them, that he is not trespassing upon their rights and privileges. This man said, "I will never call that man again; never, to attend me or anybody in my family." But you can put yourself in the position of these physicians; these men have their families, and it would be helpful to those men to be relieved of this responsibility; and as I say, I would undertake to distribute among that municipality a copy of such a pamphlet, and it should be done. I am sure the department will receive statistics in greater numbers than it does now. It will protect the man that goes to a typhoid or tuberculosis case.

THE CHAIRMAN — Doctor, I feel that the Conference owes you a vote of thanks for having awakened them to this point of enthusiasm.

The city officers will now meet in the room off to the right. We would like all those interested in the city health departments to go over into the hall to the right, where is what is known as Section A of the program of the afternoon.

SECTION A—CITY HEALTH OFFICERS

Presiding: DR. D. M. TOTMAN of Syracuse.

DR. TOTMAN — I have been requested to act by the Chair during this session, and we will proceed directly to business. I will ask Dr. Goler to assist me in the matter. As I am first on the program to present a paper—I will ask him to take charge of the discussion which follows the paper.

THE WORK OF THE CITY HEALTH DEPARTMENT

BY D. M. TOTMAN, M.D.

Health Officer, Syracuse

This subject furnishes so much material for discussion that the time allotted is hardly sufficient to cover the entire field. It is, therefore, my purpose to speak only of the more urgent problems connected with the Department of Public Health of our cities. Many of these problems are of such a nature that there is a constant and increasing popular demand for their solution.

UNPOPULARITY OF PUBLIC HEALTH WORK

The first proposition which presents itself for consideration is that the work of the Department of Health is in any given municipality always unpopular for the reason that individuals, as such, are compelled to do something against their will. The public, as a whole, are not interested, and only become so when public opinion has been centered in some direct and positive manner upon a particular subject. While the health laws are always enforced for the public good, the department deals with individuals, and each case is separate and distinct in itself. The work is, therefore, ever varying, there being seldom two similar cases to deal with. In the case of the Police Department, guilty persons are cared for, also those persons supposed guilty; while the Health Department has to contend with innocent people, who feel that someone is trying to deprive them of their personal rights and liberty. Intercepting sewers, the reduction of garbage, construction of slaughter-houses, rendering establishments, etc., are all measures which do not directly interest the public. Im-

provements and benefits of this type are paid for by general taxation, so that excepting the newspaper item, the matter is soon forgotten and creates but little or no interest. Most of these things do not appeal to the public mind in the same manner as the purchase of playgrounds, sufficient city water, numerous electric lights, gas and pavements in the streets. In fact, everything pertaining to health is generally lost sight of by the public. The only knowledge many people have that the Department of Health exists is when disease and death visit their homes or their neighborhood. It is a trying ordeal when a member of the department visits the home where conditions are insanitary, or the family is stricken with contagious disease, and compels them to clean up and protect the public from possible sickness and death. The family always has the sympathy of the neighborhood, which considers them heroes, especially if they defy order and law, and often they can be brought to their senses only by arrest or a similar affliction in their own family. The department has scarcely any opportunity to see the bright side of life in all this work. Poverty, filth, disease, death and sorrow are the things we have to deal with. This, with the various neighborhood quarrels, make the daily life of the Health Department corps one of misery and trouble. Is there a remedy for this condition of affairs or shall it be ignored? The thing which seems to me most feasible is to patiently carry on a campaign of education which shall reach all of the people all of the time. Publicity, in my judgment, can be made one of the most powerful factors.

Our people are readers and many are intelligent thinkers; so that through the newspapers and magazines the field is widely open for educational work. The training of our children, who are to be our future citizens, in the elements of hygiene with proper ideas of cleanliness, the danger of contagious disease, and the method of the spread of such disease should not longer be neglected.

One time when I was talking to a committee of the Breeders' Association, speaking about farmers in their care of the milk supply, I made the statement that when a man had reached the age of forty years I considered that if he was a man who knew nothing about cleanliness on his farm it was an absolutely hope-

less matter to train or get anything out of that man. And that is true. It stirred up those men. They were pretty nearly ready to fight me. I said it and I meant it, and I mean it now — that after a person reaches the age of forty years, that man is hopeless. You cannot educate him in cleanliness. So I wish to emphasize this last statement because away in the future I see great things coming. *"The training of our children, who are to be our future citizens, in the elements of hygiene, with proper ideas of cleanliness, the danger of contagious diseases and the method of the spread of such diseases, should not longer be neglected."*

ELIMINATION OF POLITICS

My next proposition is the elimination of politics. This is a delicate subject as I am aware, and must be handled with care. The most essential thing in a successful administration of any and all health work is the appointment of efficient, capable and interested heads of the various departments. These men should always be chosen upon their fitness for their work, and once chosen and having demonstrated their ability to do the work, they should not be disturbed under any circumstances. In some of the work it takes years to fully develop and train a man, and none is more capable to select such men than the health officer himself. It is a rare gift and difficult of acquirement to know men and make the proper selection for the important positions in a Health Department. The services rendered by the employees of the Health Department, to say the least, are of as much importance as are those of the Police Department; and they are exposed to dangers as they come into contact with contagious diseases and insanitary surroundings. I think that there should be a careful examination by competent authority, preferably by the State Board of Health, to determine the qualifications of appointees, who are to carry out the work of a city health department. In my opinion, the Health Department employees should be upon the same basis as those of the police and fire departments, and I would further recommend that a system of pensions should be adopted. I know of nothing that would increase the efficiency of the men connected with the health work more than the prospects of a pension for efficient and faithful work after years of service. If

these things could be carried out, the salaries would be made adequate, and if the system was graded, the salaries might depend upon the length of service.

CONTAGIOUS DISEASES

The ever-present problem of controlling contagious diseases presents great difficulties. Probably the disease that requires more labor and more constant thought than any other is the control of scarlet fever. It has been apparent, time and again, that if this disease is checked and apparently stamped out, yet it will break out again and is liable at any time to assume serious proportions. While we do not know the specific cause of this disease, yet we do know that it is highly contagious, and can easily spread over an entire city. This brings up the question as to the best method of fumigation and disinfection. To anyone who has given the subject careful consideration, it must be acknowledged that the systems now employed are more or less defective. I know that there are men who claim that they have solved the whole question, but personally I differ with them. The problem is certainly a very difficult one. The first necessity is a municipal sterilizing plant where the household bedding, draperies, carpets, upholstered furniture, and everything that can conceal and harbor disease germs can be sterilized under the supervision of the department.

This method should be employed especially with the contents of rummage sales and with all second-hand furniture. We now know for a certainty that the disease germs of both scarlet fever and diphtheria, when in a dry state, will remain virulent for a long time. If anyone has observed how children suffering with either scarlet fever or diphtheria are allowed to play in rooms furnished with upholstered furniture they can easily understand how difficult it would be to make such furniture safe. Months afterward neighborhood children, playing upon such furniture, have contracted the disease and then it is a seven days' wonder how it all happened.

CITY HOSPITAL FOR CONTAGIOUS DISEASES

It is my firm belief that the time is not far distant when practically all cases of scarlet fever and diphtheria will be taken care

of in an efficient and thoroughly equipped contagious disease city hospital. I would go further. I would include in this list measles and whooping cough. In the city of Syracuse we now take all cases of scarlet fever and diphtheria, where they cannot be properly cared for at home, or where quarantine is not strictly kept, to the city hospital. In our contagious disease hospital for the city of Syracuse during the year 1908, there were 162 cases of diphtheria cared for with 3 deaths; while in the city at large 259 cases were cared for in their homes with 22 deaths. The city hospital has everything to commend it. It is humane and is economical. For the saving of life is always a commercial asset in any community. There is nothing more expensive in a family than the care of contagious diseases and the most expensive part of it is the fees to be paid to the undertaker.

DISPOSITION OF SEWAGE AND WASTE

The next subject for consideration is the elimination of and disposal of the waste of the city. Probably the city of Syracuse has had a more difficult problem for solution in its sewage than any other city in the State of New York. About a year ago in the presentation of certain facts in reference to the city's sewage and drainage in connection with the construction of the barge canal before the Advisory Board of Canal Engineers, one of the members of that body personally upbraided me for the conditions I recited at that time. I told him in very plain language that the city of Syracuse was like "Topsy" it had just growed and that its parentage could be wholly attributed to the location of the Erie canal and the New York Central railroad. A city, like an individual, is not to be criticised for its existence. Originally the sewage of the city was almost a haphazard matter. It was built according to certain local conditions and necessities and so it grew up without a fixed general system of sewage. It is only in the last fifteen years that a general system has been adopted. That plan is now being worked out at nearly a half a million of dollars cost. Heretofore all the sewage of the city has emptied into Onondaga Creek, a small stream which in a dry season is exceedingly small; hence it enters Onondaga lake which lies in and adjacent to our city. From the lake the drainage is into

the Seneca and Oswego rivers into Lake Ontario. The work is now under way to build an intercepting sewer, which shall enter a disposal plant near to the lake. The problem which faces the city, in my opinion the most urgent one, is the opening up of adjacent suburban properties for residence sections. Two or three of these sections have but recently been admitted to the city. Practically all of the people in these sections have common outside privies, cesspools, and are wholly dependent upon wells for their water supply. It will take years to remove the injurious effects of all these conditions. The point which I wish to bring out is how can it be brought about that all sections which are to be occupied by residences shall be first properly sewered and supplied with city water? At the present time the method of obtaining sewers is by petition through the local alderman to the common council; and they can accept or reject. It so happens that in a given locality a certain number of people are opposed to the assessment which follows the building of a sewer — they can defeat a candidate for the office of alderman. It appears to me that it would be perfectly proper and expedient to put this whole matter in the hands of the health officer with power, and laws ought to be enacted to that effect. There are certain inalienable rights. One of these is that house and home owners are entitled to a healthy and clean place on which to locate their habitation. And the soil under our houses should be free from all sources of contamination. Another inalienable right is that every inhabitant is entitled to pure, uncontaminated air. In my opinion the future existence of the human race depends upon keeping the atmosphere free from injurious substances, such as smoke, dangerous and poisonous gases, and from dust, which can be easily introduced into the air; and one of the great problems in the safe-guarding of the public health in our cities turns upon this latter point. If we can solve the dust problem, the most important step in the control of tuberculosis will have been taken.

In the city of Syracuse the greater part of the garbage is collected and taken care of at a reduction plant. With careful handling this will probably solve the care of what is known as green garbage. The other refuse or waste including ashes, papers and

other waste material from the houses is disposed of in various low-lying dumping places. These refuse dumps are visited daily by hundreds of people, gathering up the papers and every conceivable thing which they can find. It is easy to understand that this is a possible source of some of our contagious diseases. This refuse is often gathered by little children and taken to their homes, and there sorted over by these same and other children; thence taken to the junk dealer, and again sorted over; from thence it is sent to various manufacturing plants to again expose a large number of people. The thing seems to be unending in its possibilities.

RELATION OF MUNICIPAL AND STATE HEALTH AUTHORITIES

I believe that the relation of the municipal and State health authorities is a question worthy of consideration, yet I hesitate to touch upon this subject, because I believe that there is little, if any, ground for complaint at the present time. In this same connection the relation of the general medical profession to the Health Department work is deserving of serious consideration. The efficiency of the Health Department is largely dependent upon the earnest and willing co-operation of medical men. Likewise the success of the municipal and State departments is correlative, for the success of one determines to a large extent the success of the other. There is undoubtedly more or less ground for improvement and for the insuring of more cordial relations, and it is certainly true that the present tendency on all sides is for the encouragement of these relations which are in fact nothing but mutual interests.

In conclusion, let me say that no municipal health department will reach its highest efficiency without meeting and answering some of these problems which have been presented.

DR. GOLER — I have been asked to take the Chair during the discussion of Dr. Totman's valuable paper. While there was no applause during the reading of the paper, I feel that we all of us in our hearts applauded most of the things — if not all — that he had to say.

Once upon a time, in the city of Grand Rapids, I listened to a discussion which was limited to five minutes and to the question, and when one speaker sat down there were two or three other people ready to speak at the same time. I trust that you will not all speak at the same time, but the discussion of the subject will be limited and the ladies and gentlemen are asked to speak directly to the question or the Chairman will interrupt them. Now Dr. Totman's subject is open for discussion.

DR. WALTER A. COWELL, Olean—First, I want to thank Dr. Totman for his paper, for the earnestness which he has shown to us and the excellency of his talk. There are a few things which I will mention, namely: I think all our efforts will be in vain, largely, unless we have the public educated to appreciate the efforts we are making for their benefit. And education should begin with the child. We should train our children as much as we can in their habits about the home, not allow them to use handkerchiefs, towels, or washcloths that others have used. Be particular about these things they have to deal with, and inculcate into their minds an idea of sanitary things when they are growing up—not leave it to the State boards. Let the fathers and mothers train the children in proper sanitary principles as they are growing up.

The question of sewage disposal. Our city is a small one—only about 20,000. So many things I would say if I had the time, but that wouldn't be in harmony with what Dr. Totman has said. We have two septic tanks in the city doing very fine work. Part of the city is without tanks, but with the old sewer system which empties into the Allegany river. Our garbage disposal—we have a plant of which we can feel justly proud. One which ranks among the first. We have a system—a can is left at the house once a week 26 inches deep, 14 inches in diameter. That is thoroughly sterilized before being left there and left there a week and the housewife puts her garbage into it. No bottles or paper. In a week's time the garbage collector comes and puts in the place of that can a new can which has been sterilized, and removes the other can to his wagon, without taking the cover off, and takes it to be disposed of outside the city limits. The can is scrubbed with hot water and revolving brush, and then put back on the wagon to be taken out next morning. Cans are never opened in city limits. The charge is ten cents per week to those served. I feel in that way we have a good system. The garbage is treated chemically and we get soap grease, which is sent to the soap factories, and phosphate is made of the rest, which is the residue after the extraction of the grease. Papers are collected in separate wagons, bundled and sent to manufacturers. In that way we have a pretty good disposal for our garbage. The question of sterilization. We do not have a city plant for carpets and furniture. We do recommend in connection with our circulars that the mattress be burned and all furniture, carpets, portieres, etc., in the room be thoroughly aired at least twelve hours in the sunshine. We do not demand that, but we always send printed suggestions with our man who fumigates. These are left with the families. We feel we would like to have our sterilization plant, but at present we must do without it.

DR. C. D. MCCARTHY, Geneva—I wish to ask the physician whether that collection of garbage was collected by the city or by a private corporation.

Answer—Private corporation. Guarantee to take it away once a week.

DR. E. H. CODDING—The garbage is treated chemically and they get the fat and phosphates. I would like to know something of the process—whether by heat?

Answer—I am not certain just the method, but the fat is extracted and leaves a dry, pulpy residue after extracting the fat, which is pressed into cakes and sent out as phosphate. I have it from the manager of the concern that it is a chemical process.

DR. GOLER—That is a general, well-known manner of extraction. May be seen in Rochester.

DR. C. D. MCCARTHY—One thing it seems to me, brought up on this other paper, about the establishing of quarantine. It seems to me that that has run wild. The idea of quarantining for typhoid fever! It is quarantine run wild. Contagious diseases removed from the house by force! I expect that Dr. Totman means in those cases where they are not properly taken care of at their own homes, and that you do not advise taking each and every case of scarlet fever from the home and putting it in a hospital.

DR. TOTMAN—Well, I think I do, Doctor, generally.

DR. MCCARTHY — Then you must know that that hospital is in pretty good shape. The point of that is this: That I do not think they should be taken from their home by force and put into a contagious disease hospital, Mr. Speaker, unless they would put their own wife or child in there. If it is good enough for that, all right. If not, they should not insist upon doing it. If it were my wife or child they would not do it. If the city will supply such a place as that, all right. If they do not supply such places as that, it is all wrong, and it is the health officer's business to see that such a place as that is supplied or else not use the force. Why they should remove some of these cases I do not understand. Why we should have so much of this "fumigation" I do not understand. It is news to me why the family, where this contagious disease exists, is not visited by the health board or some person connected with it, and taught what to do in that particular case. Those upholstered chairs removed, portieres removed, those lace curtains removed from the room, the carpet removed from the room. Then the patient told not to spit on the sheets or the floor. There is where your contagiousness comes. It is from the filth. Hygiene is cleanliness or prevention. Now you cannot prevent contagious diseases unless they are clean about it. You cannot prevent them with measles if they are spitting on the floor, or spitting on some article of clothing. You cannot do it. It is simply cleanliness. The idea of a central plant for these things I do not know about, in a city like Syracuse, Rochester, Albany or New York, but it seems to me that in the removal of these things from the house where the contagious disease is to this central plant there is danger of communicating the disease. It seems to me so—I don't know; but I think there is less need of infection if there is plenty of fresh air in that room and the people are taught to be clean with it, the same as with consumption. If the expectoration—the spit, the good old Anglo-Saxon word—is taken care of there is not much danger of your consumption. Isn't that right? And it is so with the rest of the contagious diseases—every one of them—just the same way.

There is another thing I notice in passing through some of our cities—I won't mention any names—that the cities are not clean. Your alleys are not clean. There is a lot of refuse and, in the rainy weather, a lot of standing water in your alleys. I will not mention any names, but I can take you to places where, if the people can live in those places in the city, they can live anywhere. I do not know what the boards of health are doing to allow such places to exist. You say that you have to have places for your poor people. If you *will*, let them be *clean* places. Make the street department clean up your alleys.

DR. RALPH ROBINSON, Lackawanna — I have been very much interested in this paper of Dr. Totman's and also in the speeches of the two gentlemen who have just finished. One point that came to my mind, as Dr. Totman spoke, was this, more especially in the smaller cities perhaps, to have a good board of health—one that will stand behind the health officer and whatever he does. In the city which I represent we have a health board which is composed of physicians only. I think that is an almost unheard of thing. As you, perhaps most of you, know, the city of Lackawanna was just incorporated this last summer. There has been really no health board there. It is a place which has grown up very quickly and has been under the town government, and the board of health of this town has taken very little interest in the sanitary conditions. At the present time the board of health is doing all in its power to make Lackawanna a clean and healthful city, but it has a great many difficulties and difficult problems to encounter. As Dr. Totman said, I believe that education is the vital point that has got to be reached. Each one of the school children ought to be given some instruction, I believe, along the lines of healthfulness. I was interested to hear what Dr. Totman had to say about the cases of scarlet fever, and how in Syracuse, where there are cases where they are positive that they cannot keep a proper quarantine, they take the cases to the city hospital. The last month or two I have run across two or three cases where I was positive that such quarantine could not be kept. If I may illustrate: One case was in the house of a Polish

midwife. This midwife has been licensed to practice midwifery in the county of Erie. She had a case of scarlet fever in her house and yet wanted to go to work and take care of confinement cases. One afternoon, about ten days after she had been placed under quarantine, I happened into a house and found her taking care of a woman who had been confined but a very short time before. I ordered her to go home and at the same time placed a policeman in front of her door. The next morning I heard from them. They called me up over the 'phone and wanted to know what I had locked their house up for. Of course, I did not know that their house had been locked, and then her small boy in broken English said: "Well, you locked our house." I said: "Not that I know of." "Well, you put a policeman in front of our door. You know what that means. You know what you are—one crazy fool." So I run across a number of other cases very similar, and we have a very large population of foreigners there to deal with, and so, in such cases, I think it is all right and proper that they should be taken to the hospital.

DR. F. E. FRONCZAK, Buffalo — One or two things I want to take up. First thing, I believe the health officer should be out of politics—the position of the health officer should not depend on whether the mayor is Democrat or Republican, but a question of how much he knows about sanitary science and enforces the law in relation to sanitation.

I also believe the men who work in the health department should be out of politics. In the health department of Buffalo, in our health department of 100 men, I know about three men—I do not care what they are as long as they do their work. These men are under civil service and are taken always from the top. Number 1 always on top, and number 2 not taken if Number 1 wants the position.

The second thing that the health officer of the town should have should be courage. A coward has no business in the health department. When he knows something is wrong he should simply see that the wrong is corrected and that the law is enforced. It is true that real often, under present conditions, the health officer must depend upon the good favor and the friendship of his medical confreres, because they will try to get his position—they will try to do him sometime and squeeze the health officer at the earliest opportunity. But if the thing is out of politics, if the man has courage, if he enforces the law, and if he treats the medical men fairly he certainly shall make them his friends. There is no doubt that much could be done to improve the conditions at present prevailing in the various cities. There is no doubt that quarantine could be enforced better. In many cities, I understand, they quarantine almost everything. Some villages have quarantine for measles—placard a house for measles. As a matter of fact I am not a great believer in placarding a house. I believe it is an invitation to all the neighbors to come in and see who is sick. I believe in putting the people on their honor. If it is a case of communicable disease keep the case isolated, and if you do not, we will simply take the case from the house and put it in the hospital.

The question of milk is a very serious proposition. In the near future, I am quite certain, we shall have the so-called "single service packages." Single service packages consist of packages covered with paraffine used once and not for anything else after that. The question of cost seems to be entirely the same, whether paraffine or the glass bottle, counting the broken glass bottles, the cleaning of the bottles, with the sterilizing of them, and with the number of losses. I believe the single service package will be in the near future in general use.

I also believe what Dr. Schurman said this morning, that there should be a special school for sanitary officers. I believe this State should insist that a physician, who becomes a health officer of a city, should know something more about sanitation than merely the articles which he finds in the city charter and the books and rules and regulations of the city. He should know something more than that. A school of that kind, no doubt, will be of great advantage to sanitary officers of the State.

DR. F. A. WATTERS, Lockport—You all heard the doctor from Olean make the statement about the teacher in the public schools who had consumption, and reporting the case to the board of education in that town. In Lockport we have a similar case—a bell-boy in a hotel has a case of consumption in the first stages. I would like to ask what shall we do with these two cases? Shall we allow them to continue their work, or what?

DR. GOLER—That may be covered in the closing discussion if Dr. Totman wishes. It hardly seems as if some of the salient features have been covered in this discussion.

DR. JOHN EDWARDS, Gloversville—I wish to say a word relative to the contagion of communicable diseases. I think the pamphlet issued by the State Department of Health in which the teachers are instructed relative to communicable diseases is a greater factor than anything else for the prevention of these diseases. I believe that they give there that instruction—all they need—relative to scarlet fever, measles, whooping cough and kindred diseases, and which will be a great factor in the prevention of these diseases. Relative to scarlet fever, I would say that the patient ought to be isolated completely. We could have no hospital in our city and, of course, my procedure is to put a guard over the house: that is, a policeman who is not to allow anyone to go in or out of it, and placard the house "Contagious Disease." We are in the same boat with Syracuse as relates to the disposal plant. We are about to erect one. I think that the proper way to have such a thing conducted is under the State Department of Health, under their jurisdiction.

DR. H. H. CRUM, Ithaca—In regard to placarding houses I feel that it is entirely proper to quarantine a contagious disease, at least in my city, for I find that is the only way I can hold quarantine. We do not at present quarantine measles, but scarlet fever and diphtheria we do. I placard the house, although the card does not say what disease it is. If quarantine is broken the neighbors telephone me and help me. I have no inspector to follow up these cases, and the only way that I can be sure that the quarantine is held is to depend upon the kind public who are very careful to let me know if anyone doesn't walk the straight and narrow path. I have had a number of people arrested, some fined, and some stayed in jail over night, and I would never have known a thing about it had not the house been placarded.

DR. TOTMAN—There is very little that I will take up your time with, except the matter about the removal of patients to the city hospital. My paper presupposes absolutely that the city hospital should be efficient and a proper city hospital. And no question about that. Not a place for exploiting graft and doing things in crooked ways—not a bit of it. But a city hospital. We have one, I believe, in Syracuse, and while three or four years ago we had a great deal of trouble in getting patients there, now people want to go into that hospital, and children cry when they are taken out by their own mothers. If that isn't a proof of the efficiency of it, I don't know what is. Now I want to tell you how popular you can make it. This summer one of our prominent physicians acquired diphtheria. He, of his own accord, went to the city hospital. Dr. Halstead, another specialist, in treating him innocently for a sore throat, acquired diphtheria, and Dr. Halstead went to the hospital, and the words of praise that those men gave us were worth the whole thing.

Now as to quarantine of diphtheria, I would not take out at the present time people where they could take care of their children properly, but I want to say that during this last spring I visited during two days some thirty-nine cases of scarlet fever in the city. I went to every house to see what they were doing. They were in fine houses and among the better class of people generally, and how many did I find with a nicely prepared room out of the thirty-nine cases? How many? We have preached it, talked it, begged for it; we have sent men to help do it, to fix up a room. How many did I find? I found four where they had a place decent to keep a case of scarlet

fever. Just four. I did find children playing on upholstered furniture and every conceivable place over the whole house. We had sent men there and begged and pleaded and offered to help them and instruct them, and they would not be instructed. Now I believe, as I say, that the time is fast coming that the best way to educate people is to take their children out and take the mothers and fathers too, sometimes. They need it.

DR. GOLDBERG—I wish I had not been the chairman of this meeting because I should have liked to take part in that discussion, but I simply held back because I think the chairman's business is to conduct the meeting and not do the talking. The quicker the physicians learn that and learn to conduct a meeting the better meetings and discussion they will have. There are a great many things I heartily agree with, and some I do not agree with *at all*.

I would like to make two or three announcements. There is a garbage plant in the middle of this city where the garbage of the city is disposed of, and anyone who desires to visit that plant we will be glad to make arrangements for them to visit it or give them instructions how they can reach it. There is also a municipal hospital for pulmonary phthisis incipient cases, I don't know what they are, but various kinds of cases, that we would be glad to show you or tell you how to get to that place. We would be glad also to open the health bureau in a building by itself, so that you may visit it and see the conduct of the office here in Rochester. After this paper I have a problem in milk work which we will be glad to demonstrate upon some animals which may or may not be tuberculous, and which we have kept for the purpose. We will be glad to show the technique by the injection of some of these animals with the milk of the city.

I have had our clerk bring up here the blanks and forms, etc., and will try to show that it is perfectly possible upon this plan, or a somewhat similar plan, to conduct the business of a health bureau, whether it be in a city of 2,000 inhabitants or a city of 200,000 inhabitants. In the first, in the organization of the larger city, we believe that the health organization should endeavor to segregate, as it were, the clerical and executive affairs and the milk affairs, and at the same time make the records of the department so that they may be easily and readily accessible to the men in the department, to the physicians and to the public. That material will be demonstrated afterward.

THE ORGANIZATION OF A CITY HEALTH DEPARTMENT

BY GEORGE W. GOLER, M.D.

Health Officer, Rochester

The organization of a health department should comprehend an elastic and business-like arrangement of the department, so as to permit the orderly notation of the data of health and disease ready for instant reference and use, and the notification of that data to the physician and to the public.

Public health organizations were originated for the control of disease, the collection of vital statistics, *i. e.*, mortality statistics, for the control of nuisances, and the removal of wastes in their relation to disease. Our inquiry, therefore, is directed to the best means of doing the work of preventive medicine and for collecting and filing useful statistical matter relating to disease, and to health. To do this work, it is necessary that both order and discipline be preserved so that at any moment we may have this data readily at command in a form so that the physician or the layman may understand the problems which we as sanitarians have to demonstrate to them. As the subject-matter of this paper is so broad it will be dealt with generally rather than in a specific manner. In doing so I shall divide the subject into several heads, taking as a basis for the organization of a health department the work that is done in the city of Rochester, believing that although this is a large city, yet the manner of organizing the work in our department is such that it may be taken as a basis for the organization of a department no matter how small it may be.

VITAL STATISTICS

The manner of collecting marriages, births and deaths has been prescribed by statute. The entry of this material in a combined index and ledger may be carried on as in the forms here illustrated. The certificates of vital statistics are of priceless value for legal and social purposes. The good name of a woman, the

legitimacy of a child, the proofs of death for purposes of inheritance are of such importance that they must after being copied in a local register be filed in an indexed case and by the local register preserved in a vault or safe, and the originals at the end of each month promptly sent to the State Department of Health at Albany. All such copied records should be kept in book form. I do not know that even a loose-leaf ledger is desirable for such purposes. For other records and reports the card catalogue system is par excellence the system to be employed, except perhaps in cases where a desk record is required for ready reference, but even here the card record should be made the basis of the work.

NUISANCES

In our work it has been found that the card catalogue serves best the purpose of keeping the records of the office in an orderly manner. The basis of this work is a card of uniform size, four and one-half by eight inches, upon which, in answer to questions printed on the card, are entered all the data whether relating to nuisances, infectious diseases, the disposal of wastes, plumbing and drainage, milk, food or miscellaneous complaints. The cards for the different infectious diseases are differentiated by the colors usually associated with the disease as: Blue for diphtheria, pink for scarlet fever, and yellow for smallpox. Every complaint, or every report of whatsoever nature is filed with the clerk of the department who enters the substance of the complaint or the report of a contagious disease in a complaint book and places a slip from the book on a spindle in the inspector's room. The complaint slips are dated and serially numbered. The inspector takes his slip, goes to the premises indicated on it, fills out the card with the substance of his inspection and returns the inspection card with the slip attached, to the clerk on the morning of the following day. This slip is taken from the card and pasted over the duplicate in the complaint book from which it was taken: thus showing above the duplicate in this book the signed statement of the inspector, with the date, and if any delay in making the inspection, the reason for that delay.

If a contagious disease requires posting, a placard is posted on the house, all the necessary data recorded on the printed card,

corresponding in color with the placard, the names of school children in the house are ascertained, and the school the children attend notified on a printed form not to receive them until the expiration of the isolation period prescribed by the ordinance. When inspection cards of any form whatsoever are received at the office whether they relate to nuisances or infectious diseases, they are handled in the same general way. Wherever a contagious disease is noted, an abstract is made in a counter register, including date, street and number, name, time at which the period of isolation will expire, so that telephone and counter inquiries may readily be answered without having to go to the files, and so that the period of release may be noted and the inspector be furnished with the slip for the removal of a placard and the cleaner, and wherever the family insist upon it, the disinfecter may clean or disinfect the premises. Early in the morning cards that have been filled out with the previous day's work are collected by the clerk, the slips removed and pasted in the book by him, the cards referred to the health officer, who initials them, makes any necessary inquiries and then makes orders for the abatement of nuisances under the health ordinances. These orders are made on the back of the original card, these cards are then transferred to the stenographer, who makes the orders for service in duplicate on a prescribed legal form, stamps the card with the date of the order, and returns the cards to the clerk, who, before filing them, marks the copy of the order returned by the inspector with the date of reinspection, after the order has been served according to law. When the time for reinspection arrives the duplicate order kept in a separate file is given to the inspector, who makes a reinspection, and returns the paper to the clerk of the health office with his notation upon it. If the order has been complied with, it is stamped "abated" and filed away with the original form in the card catalogue. If the nuisance has not been abated, it is referred to the health officer, who initials it, making any necessary notation on the card, stamps it "Attorney," and it is sent to the corporation counsel for prosecution.

All data in the office, except vital statistics and milk inspection, are filed under street and number; for the location of a complaint and not the name of the person upon whose premises the com-

plaint occurs is of chief interest to the sanitarian. So, whether it be dirty premises, garbage, an open fly-breeding manure box, a vault, defective plumbing or drainage, a contagious disease, all data relating to any one of these nuisances or reports goes through the same simple routine and is handled under the ordinances as the law requires.

CONTAGIOUS DISEASES

In cases of contagious diseases, postal cards for reporting these diseases are supplied to the physicians. These cards are given the inspectors who return them to the clerk dated and initialed. In diphtheria, an inspector, assigned for the purpose, makes all cultures and refers them to the bacteriologist for examination, who reports the result in a separate counter register for ready reference. Sputum is to be sent to the office in bottles specially prepared by the office and results entered in a similar counter register. Reports of procedures and precautions in cases of pulmonary tuberculosis are received on forms according to law and filed in a separate card system.

PLUMBING AND DRAINAGE

Plumbing and drainage inspection is performed by a chief and three assistant plumbing inspectors, the data filed on a card system, as shown by the appended forms.

MEDICAL SCHOOL INSPECTION

Medical school inspection is performed by twelve medical school inspectors; each physician has from two to three schools in his district, and is responsible for the personal hygiene of the children in the schools, the sanitation of the school buildings, and is also responsible for the care of the sick poor in the school district in which he visits. His work in the schools is mainly directed to the physical examination of school children, and his reports are returned on cards, as shown, and are filed for reference.

Children who suffer from defects are referred to their parents with a recommendation to secure proper medical supervision and treatment, or they are, with the permission of the parents, re-

ferred to a dispensary, many cases to the clinics of the Rochester Public Health Association, without whose aid this work would have been impossible of performance.

MERCANTILE INSPECTION

Those children between fourteen and sixteen years of age who are compelled to go to work are required to comply with the statute relating to mercantile and factory certificates. The law requires these children to be in good physical condition. Every child applying for permission to work is weighed and measured by the mercantile inspector, and if any marked departures from the normal are found by him, the child is referred to a medical officer for examination. All data relating to the child are filed on a card. The nose, throat and teeth defects are charted on the card, and the child required to have these, or any other defects remedied before the certificate is granted. The child of parents financially unable is referred to the clinic of the Rochester Public Health Association.

FOOD AND MILK

For the inspection of restaurants and bakeries a score card is being designed, and these establishments will be scored on the basis of one hundred.

Dealers of milk are licensed, and each milk retailer is required to exhibit a sign on his wagon or in his store. For the inspection of dairies score cards are used, a card of a somewhat different character being provided for milk producers. These score cards are filed, the essential points being entered in a tally book for ready reference. Every producer and dealer receives a personal letter.

Two milk inspectors collect milk samples for chemical and bacteriological examination. These samples are received by the chemist, who refers them back to the office for prosecution if a violation of the milk ordinance is found.

TUBERCULOSIS

A clinic for tuberculosis is maintained at the health office where patients in any stage of the disease may apply and may be cared

for at the Municipal Hospital for Tuberculosis without cost if they are financially unable. The records and the examination forms for patients are kept by the same simple score card system.

TENEMENTS

With the growth of the population, want of cheap and ready transit, the housing problem in cities is assuming large proportions. In an attempt to secure an adequate housing law a score card for dwellings after the plan of Professor Commons of the University of Wisconsin is being used by us.

This in brief is the work and the organization of the Rochester health office. Every inspector reports at the end of each day the number of inspections and the character of the work performed by him. Weekly meetings of both the medical school inspectors and the sanitary inspectors are held, and occasional visits in the districts are made with the inspectors.

The work herein outlined is of course the work of a city of many thousand inhabitants, and it may, therefore, be said that this plan cannot be adapted to the work of a village, town or small city, but this is not so. However small the place and few the workers, the plan is so simple and so elastic that it may be applied to any town, village or city. Given the smallest town with a health organization, a four-drawer card catalogue, with as many different printed forms as may be desired, two or three blank books printed, or with headings written in by hand, two or three filing boxes for keeping certificates and other forms, and the same general plan for carrying health work may be successfully carried out.

In a great State like that of New York a uniform plan of filing sanitary and hygienic records is of such importance that the application of a system that shall embrace the whole State would be of great benefit, not only to the State, the health officer and the medical profession, but to the general public.

DR. H. M. HICKS, Amsterdam—*Mr. Chairman, ladies and gentlemen*—I wish to thank the essayist for his very practical and able paper—it shows the working out of a comprehensive scheme, it is a living active demonstration of its worth and value.

I had the pleasure of being shown through the health building this morning by Dr. Goler, and I want to take this occasion to congratulate the

city of Rochester on its very active and progressive department of health which is so ably managed by Dr. Goler and his trained assistants.

Dr. Goler has seen fit to advise his system, because of its practical value and simplicity, for the entire State, or for those portions who have not yet developed a satisfactory system of their own. Very good; I am in favor of a uniform system, although, of course, we all realize that this system must be modified so as to be elastic enough to fit the small, medium, and large communities. Now let us get at it, let the dreamer dream, give the fellow with a theory an opportunity to suggest his theory, and last but not least, the practical, the common sense, the well-tried plans, be brought forward and discussed in these meetings, and ladies and gentlemen, out of this mixed and perhaps heterogeneous mass, of how to care for the best interests of the communities' health and happiness will come a system approaching perfection.

One word in defense of my statement as to dreams and theories. It is not all of us who possess the rare gift of the gods, originality, who can, at any time they may be called upon, be trusted to make something new, their inspiration always equal to the occasion.

But you say, they are often impractical, their ideas will not stand the grilling of experience. That also is true, but don't get discouraged, try again. Charles Darwin possessed a rare mind, and he was constantly theorizing, and as he himself admits, he never had a theory that he did not have to change except one, that was the theory of the coral reefs.

We are living in a great age. We are emerging from a condition of darkness, to one in which we can see one way, as yet dimly. It is within the easy memory of every person in this audience that our knowledge of micro-organisms has been obtained. And, ladies and gentlemen, what a field it has opened. To be brief, it is summed up as follows: find out your micro-organism, and then prevent it. Don't talk of cures; prevention is what humanity and modern civilization demand, and it can only come through you as modern, official sanitarians. Now to get back to this subject of health boards and their organization. I believe we should have a comprehensive scheme that will be universal through the State. I believe that every board of health should make a report on what it has done, to the State Commissioner of Health annually; this is important. Let us have a bureau of information, at least, if we don't have the universal system, where the rest of us can go and find out what some of us are doing and how we are doing it. It would be a great source of help.

Think of it, your State is so alive to the necessity of its military that it knows down to the last strap what we have, and where we have it. Not only that, your national government is also so awake to that fact that it also knows just what every State has, and very carefully inspects them annually. Now, is not the protection of the health of the community just as important? And are we not just as worthy of as careful organization against the greatest foe in the world disease, as against war?

But, as I said, we are emerging from a darkness that has always recognized "war and rumors of war," and has paid but little attention to disease prevention.

I wish, however, to say a word for the men of old, that whoever wrote Deuteronomy was a first-class sanitarian.

DR. GEO. W. MILES, Oneida — I was much interested in Dr. Goler's remarks although I was glad that I was not health officer in Rochester. These technical details in which he deals I presume are valuable in a city like this where a corps of assistants is at hand in every department, but what of the smaller city — and I represent that class — a city of 10,000 where the health officer does it all? I did, during the past summer, succeed in getting one inspector added to the body to assist me; otherwise the work is done personally by me. It seems to me that where the conditions are like that they must be different somewhat from the organization of a health department of a city the size of Rochester. I doubt not that there are a number of cities nearer like my own than Rochester. A business-like arrangement like that in the city of Rochester is recommended by Dr. Goler. I agree with this entirely. It is not always easy to have that business-like arrangement for

the reason that you do not always get business men—men of business tendencies and ideas and men having the courage of their convictions to act as members of health boards, at least in the smaller cities. There is where you get politics again. In my own city it is quite as often the man who is in the political work, who is ignorant of sanitary matters and even more ignorant of the principles. If a man is afraid to do the proper thing as a health official because he may not be able to sell a necktie in a gents' furnishing store—I have found that sort of man—then we cannot get and we will not have, the business-like arrangement in the health department. I do not think, in fact, that we will have a business-like arrangement at all in the health department until we come to the millennium time, when parties are not connected with it. As long as health board members are appointed by mayors and confirmed by common councils perhaps, and sometimes not confirmed, I do not think we shall have very much in the way of business-like administration of health affairs in the smaller cities.

There is one point that I thought of in reference to the reporting of contagious diseases. In my own case, in the city of Oneida, it is the custom to report immediately to the school principals all contagious diseases. I think I have found this a considerable help during the two years. Immediately on the outbreak of communicable disease in any ward, I notify the principal of schools in that ward and notify him that no children in that family—no one in that house, teacher or scholar—shall be allowed in the school until further notice. The milk inspection in our city has gotten as far as the registration of the dairies and no further. Ran up against politics once more. During the past summer I undertook to go further but we had to have money, and on appealing to those higher up I was told that expenses must not be increased, election was coming. In regard to medical school inspection, nothing has been done in our city. I should be rather interested in hearing from health officers of some of the cities of my own size as to what has been done, if anything, along this line, and their case would be a guide, perhaps, to mine.

DR. C. C. DURYER, Schenectady—I want to say right here that there will be one city in the State where there won't be any politics in the health bureau.

Two years ago I attempted to outline a plan of bookkeeping, as we might term the organization of an office, that would be easily gotten at, the data should be readily found, and should be sufficiently accurate. I have floated along on that work, adding a little where I could get the information, and my system is not nearly so elaborate as the Doctor's, nor do I think it is as good as his. I am willing to say that, after knowing something about the operations here. We use the card system only in certain directions. In reference to our communicable diseases, we use the telephone. For the children in schools the inspectors notify the homes and the child is not permitted to attend the schools, and no one permitted to leave the house after the day the quarantine is settled. The school superintendent is notified of the number of children that are in that house and where they go to school. The secretary of the school board is always ready at a certain hour every day to take that, and then telephones to the schools all over the city the names of these children and they are not allowed to go to school. In regard to their returning to school; when the patient is released, when fumigation is done, we then send word to the same parties in the schools, and that releases the teachers from preventing the children coming. I must say I was very much interested in Dr. Goler's paper, as everybody is in his work in this city, who has any interest in sanitary matters, and I want to say I have gotten some very valuable suggestions which I hope to put into operation next year, although I shall not be health officer.

DR. GOLER—I wish to say that I have not by any means elaborated this scheme that we have in use in our office. It is a scheme that has gradually grown up. I could not have done this work without the valuable assistance of those who are associated with me and have long been associated. I was a most disorderly man I suppose, I never put anything by any possible means

where I found it, and it is an awful task to learn to be orderly, but it is simply the question of when one man has developed one department and another another and we have worked it over, adding something, taking away something, and have tried to build up this scheme as the years have gone on. Dr. Miles asked when a health officer does it all himself. That is what the plan is for, because he can do it so much better. You say you have not had the money. I would like to say a word on that. When I could not get money I practically said to the people "if you can't get the money, I will go out and tell some friends of mine you are too stingy to get it," and that always got the money. I want to say in response to Dr. Duryee that a telephone record is not a written record. We do not take telephone records. We require a record to be in writing.

DR. TOTMAN — We have had a good session, as I think you will all agree, and I hope this is the beginning of similar sessions another year and great good may grow out of it.

One question was asked about a teacher having tuberculosis, which was not answered. I think if I had the solution of that I would give the parents of the children in that school knowledge, and I think there would be a good vacancy there. The other was the case of a bell-boy in a hotel. That is a different thing. I think I would take that up with the proprietors of the hotel there and there would be trouble about it. These are delicate things, and we must not interfere with employment any more than we can help. I think there is a good chance for missionary work, and we must be careful about interfering with the employment of tuberculous people, but it is necessary to take care of them and it can be done.

SECTION B — VILLAGE AND TOWN HEALTH OFFICERS

DR. HOWE, Temporary Chairman

THE CHAIRMAN — For one minute I would like to repeat the request that those who have not signed this little card for the Ophthalmia Neonatorum should now do so. You will kindly sign the cards and leave them with the register.

I am glad to see we are in the majority in this hall. The greatest sanitary work of the State is in the rural districts. There is no talk about it. We have the forces to do it, and being, or having been for a number of years, a country health officer, I think my sympathies are with you.

While we are wishing well for the city fellows I am with the rural people. If there are questions troubling us let us have them out. I do not think any of these questions will be so lengthy but we shall be able to discuss the practical questions of interest to the country health officers.

Now, we are privileged to have with us not only one of the most active city workers in sanitary matters, but also one who is a most efficient country health officer. I do not know of any other instance where a man who was so active in city health matters is also so active in country health matters as we find them combined in Dr. Leary, who will speak on the subject of the "Work of a Health Officer."

DR. LEARY — I came here, gentlemen, to talk to you, and if you do not hear me let me know and I will raise my voice or get a megaphone.

THE WORK OF A HEALTH OFFICER

By MONTGOMERY E. LEARY, M. D.

Health Officer, Town of Gates

While the views expressed in this paper may be deemed pessimistic as to some present conditions, and perhaps by some too radical as to things desired, yet they are the outcome of some twelve years' service as a health officer gained not only from personal experience but also from intimate acquaintance with others holding a similar position. There has been no desire to belittle the efforts now being put forth by many conscientious men throughout the State, nor has there been any intention of being hypercritical over present conditions.

The present administration of the New York State Department of Health has done much to improve and develop conditions under its jurisdiction. More systematic management of the central office, closer co-operation between it and the local health officers, more rigid inspections of food and water supplies and

many other things have been accomplished which have tended to place the Empire State in its proper position. Let us not think though for an instant that all has been achieved — far from it. For example, compare the same line of work in our neighboring States — Massachusetts and Pennsylvania! It is needless to enter into details, but take the fight against tuberculosis — Pennsylvania in a year appropriated \$400,000, New York \$10,000. This year our State Department is limited to nine places where they may have their traveling tuberculosis exhibit — nine weeks! It should be on the road at least forty weeks out of the year. Rochester in one week in 1908 had over 25,000 of our people visit it. Since then an immense work has been done and an extensive plan of campaign inaugurated. We want it again, now, but must wait two or three years for it. Why? No funds and “it must visit new places.” Why is this so? Because our legislators always cut down the estimate of the Department of Health. They do this because of their ignorance of the needs of the work, and we, the local health officers, over 1,400 of us, what have we done to educate them; what pressure have we brought to bear on our local representatives to secure their active co-operation with the department? This leads to the first point in the work of a health officer: Securing the hearty support of senators and assemblymen for the State Department of Health. Just so long as we medical men as a profession, and health officers as officials, permit matters of public health to be limited and hampered by lack of funds and the indifference and ignorance of legislators, then so long are we responsible for our State being behind other States in carrying on this work.

Massachusetts is divided into sanitary districts over which is placed a sanitary officer having full charge of various health matters. It is needless to go into detail. But does not that management at least give us a chance to think of the possible advantages of a systematic division of the State into districts conforming to the present counties with subordinate town health officers? Some time ago it was proposed to abolish the local town health officers in favor of a county health officer. This met with strong protest from the men directly interested. Perhaps that plan had some good in it which could with advantage be adopted.

We must confess that in this Empire State it is an incongruity, to say the least, to have its health matters administered by a State department and over 1,400 local health officers, each working under local laws and ordinances drawn up and administered by local boards, made up of men in general ignorant of such requirements. No two towns may have the same rules and the same penalties. For instance "spitting in public places" is punished by a fine of \$2 in some places, by \$50 in others, and I have heard of a \$200 penalty in others, but never an arrest or a conviction, and yet streets, cars, etc., are filthy and dangerous just the same. In other words, there is no uniformity either in the laws, rules and regulations of the various local towns or in their enforcement. We health officers are physicians first. We are health officers "on the side." Often a conflict arises between our two functions. How often has the enforcement of health regulations lost us families; how often have we been called in to treat contagious diseases in the hope that we would not placard our own cases. Would it not be better for all concerned if the health officer did not have so much responsibility placed on him personally? Don't you know of cases of contagious disease which were never reported? If you took official action you were accused of trying to spite a man practising in your own town. If you took no action, you were and felt you were a coward. Some action ought to at once be taken which would bring the local health conditions under a uniform system. Appoint the local health officer as at present from his town, but abolish the local board of health. It's a farce anyway. What do they do? Meet occasionally, spasmodically, seven of them at \$2 a day to discuss a matter which one trained man could decide in ten minutes. Fourteen dollars for the board, and yet a physician could spend all day investigating conditions he is held responsible for, get \$2 and lose five or ten times that amount of practice.

2 Securing uniformity:

a of rules under which health officers work;

b of action by the health officer in enforcing Health Law.

Until some such uniformity is obtained, we need not wonder that more will be freely spent by the State Department of Agri-

culture in suppressing the diseases of horses, cattle and hogs than the State Department of Health is allowed in order to protect our people. Army men have a saying only too true when applied to some other things than military, "An army mule is worth ten men."

Most health officers find after a time an accumulation of records, cards, papers, etc., which around his office soon become a nuisance. The town clerk and office being the depository for other records should also include provision for those of the health officers. The salary paid is inadequate for the services rendered. Most men are paid by the call, but how shall the many hours of clerical work be remunerated? Only by having it done by some official who has not only the time and convenience but is also paid for such labor. Most towns have imperfect records kept of the various statistics. Who could look back a few years and investigate an epidemic of some contagious diseases. Cards, etc., if kept, may be in the houses of several physicians who have held the office of health officer. Again, the making out of records is too often burdensome to a health officer who desires to perfect the details of his office. If the blanks he has to make out could be printed so that an original and copy or duplicate could be made at the same time, much labor would be saved him and as a result more accurate and complete records made.

3 Records should be easily made in duplicate and filed in the office of the town clerk.

Until this is done and the burden removed from the health officer, there will result loose methods and no incentive to better, for at present any desire to improve merely means more routine and clerical work for the health officer.

How insufficient and inexact oftentimes are the statistics furnished to local boards of health. This probably is no truer of the town boards than of the health departments in municipalities and villages, and depends more upon the failure of physicians to comply with the regulations than upon any lack of effort of the health officer. Deaths, of course, are necessarily reported promptly in order to secure a burial permit. Births are reported less promptly than deaths and oftentimes inaccurately, although much has been accomplished in securing better results by paying for the reporting and filing of births and deaths by the attending phy-

sician, although oftentimes physicians have not bothered making out their bills for filing birth and death records. A fee for the filing of a record of each case of communicable disease would improve the accuracy of the records and the promptness of their filing.

4 Statistics should be more accurate by securing co-operation in prompt filing by the attending physician.

No figures will have any real value till this is accomplished.

The local conditions with which I am familiar are peculiar, as the town of Gates is contiguous to the city of Rochester and there are no physicians residing in the town, therefore all of the medical practice is done by physicians living either in the city or in towns adjacent to the town of Gates. I have had physicians living in the city of Rochester, when called to account for not reporting cases of contagious disease, apologize on the ground that they did not know it was necessary to report such cases in the country. Why they should imagine one condition of affairs existed up to the middle of the road which separated the city and the town, and an entirely different condition of affairs existed on the other side of the road I cannot imagine. A contagious disease is just as dangerous and quarantine as necessary in the one case as in the other. I sometimes question the honesty of the explanation. Some cases are much delayed in their reporting. A short time ago, a case of diphtheria was reported at 9 o'clock at night. On going out the next morning about 9 o'clock to placard, it was found the child had died at 5 a. m., having been sick for three or four days, and another case of the same disease was recovering after an illness of a week. The latter had never been reported, and anti-toxin was used in both cases early in the disease.

One is led to believe that if the second case had not showed indications of dying, neither would have been reported, and there would have resulted a focus of infection. What is best to do in such cases? Report it to the prosecuting officer of the town board? Nothing is done. Take it up yourself and swear out a warrant? Acquire the hatred of this physician forever after. The straight path of duty is clear, but the prosecution of such measures should not rest alone on the health officer. Too often physicians not only conceal cases, but misinform the families; as, for instance, a case of scarlet fever was reported with the sug-

gestion that it was so mild that quarantine was hardly advisable for the enforcement of measures too severe and rigorous; when this physician, as a matter of course, knew that scarlet fever should be quarantined rigidly and for a specified time. Last year there were nearly one hundred cases of measles found in one town, and of these not more than twenty were reported, and only one-half of these by physicians. Yet in many cases, physicians were in attendance. One physician told me that when his families called up, he prescribed over the telephone so he would not have to quarantine. Easy conscience. In the securing and placing of placards there should be a uniform sign secured or furnished by the State. This would tend to systematize the whole process; make it easier for the local health officer to secure proper signs or placards, rather than as in many cases, being left to his own ingenuity in many cases. Some towns use but few placards, and to secure any considerable supply would be rather expensive and burdensome. If these could be obtained or furnished uniformly, it would make it easier.

5 The reporting of communicable diseases should be paid for the same as births and deaths and the failure to promptly report should be immediately investigated and prosecuted by the prosecuting attorney of the local board.

If something of this sort is not done there is placed a premium on concealment of cases.

How few cases of tuberculosis are reported in the towns. In the past year not a single case was reported in the town of Gates, and yet four deaths were attributed to that disease. This, of course, is the same condition of affairs as exists in the cities, and yet how much could be accomplished if the local physicians and health officers would only learn to treat this disease the same as they treat other communicable diseases, or rather in the light of the remarks in the previous section, treat this disease even more ideally. Why should not the people of the towns be entitled to the same protection from this disease as those living in more thickly settled portions which we call villages and cities?

How many town officers are there who have distributed supplies to tubercular patients? How many have given instructions in such cases? And yet the local health officer, being a practising physician in a town along with two or three other physicians, is

always liable to the unjust criticism if he shows any interest in his work of "being out after patients." If he is sensitive, he hesitates to carry out those methods which he knows are right. If he is a little unscrupulous he becomes overzealous, and yet, I think, taking it all in all, a physician who assumes the position of health officer in a long run is apt, if he is any sort of a man and honest in the performance of his duties, to unjustly make enemies.

Some provision should be made by which instruction is furnished the residents of towns upon subjects connected with hygiene and sanitation. Local boards of health might well provide a portable lantern, screen and slides, and the health officer should be remunerated for his services and throughout the winter a systematic course of instruction by means of lantern lectures offered to the residents of the town. These talks could be given in the local schoolhouses and thus reach a number of centers of population. By doing this during the winter months, the residents would not only be instructed but entertainment furnished at a season when time is not so valuable as at other periods of the year. Perhaps by assigning different subjects to other members of the profession living in the town, greater interest might be stimulated and the matter of lecture fees be reduced, but someone must of necessity have charge of the apparatus, and the arranging of the talks, and this falls upon the local health officer, who should be properly remunerated therefor. Adjacent towns might unite in the purchase of apparatus and thus lessen the expense. There is no more entertaining way of instructing than by lantern slides, which need not be limited to tuberculosis but might well be used on many occasions. Disinfection after removal or death of a case of tuberculosis is I suppose honored in the breach. Some suitable apparatus and competent person ought to be secured by each town and the provisions of the State law rigidly enforced.

6 Tuberculosis should be handled in the towns as in the cities. Instruction should be furnished and disinfection carried on.

If this is not done we lay ourselves open to the just criticism of lacking in the instituting of preventive measures.

How simple it seems to go to a resident of a town, tell him of the existence of a nuisance and consequent complaint, investigate and demonstrate the proper remedy. Come back in one week or

two weeks and you find — nothing done. The second or third visit you begin to insist and you find out what might have been perceived at first, there is no intention of bettering conditions. Perhaps by moral suasion, you may get, after an hour's argument, promise of prompt action. These results are expensive to the town and to you. Money and time wasted. The health officer should not be expected to do more than make the first inspection, suggest proper remedial action, give definite time for their application, call promptly at the expiration of that time. If proper action has been taken the complaint and resulting action should be filed in the town clerk's office. If no action has been taken, then immediately a report should be placed with the prosecuting officer, and he should be compelled to act promptly. The health officer should not be or expected to be responsible for the direct enforcement of the law or its penalties.

7 The enforcement of remedies for abating nuisances should not rest upon the health officer more than to report the existence of the same.

Sanitary conditions will never obtain in town or country districts so long as the health officer, often the attending or family physician, is the only one to enforce them. He accomplishes much, by mere suggesting, of which he never knew but in flagrant cases. He is not the one to play policeman.

If the average health officer of an average town were to properly and thoroughly inspect the sources of milk and food supplies, would he not be accused of working a graft? To better the common, ordinary, existent insanitary conditions is a matter of education. It takes time. To teach the average farmer is like teaching a child. He has to be shown over and over again. Even then he often "forgets." Instruction has to be repeated. No town health officer wants to go about with a club and demand the institution of proper conditions. It means too often fight! We as physicians have too many worries and aggravations to seek new troubles, but unless we do some of these things are we living up to our duties? Why should a farmer in our town be allowed to raise milk under the most filthy conditions for shipment to a neighboring city or village (yes, or even for sale locally), and we make no protest or endeavor to correct these conditions under

which it is produced? Why should all such endeavors rest upon the health officers at the consuming end of the line? Would there not be greater hope of success if there were hearty systematic co-operation at both producing and consuming ends of the line? But suppose we started out to institute such active systematic efforts, can you see any opposition, or our fees viewed with the suspicion of personal aggrandizement? Yet who can deny the necessity of those same endeavors to purify at their very sources our food supplies. Would not such ideal conditions the sooner exist if there were greater uniformity and co-operation among the various health officers? While on the other hand would they not exist the sooner and more effectively if they did not depend so much upon the local physician, but more upon him as a man and official representing the State and a sanitary district?

8 Milk and food supplies should be more thoroughly investigated and insanitary conditions corrected by officials at the source rather than at the consuming end.

The State Agricultural Department does a great work along the above lines but inadequate at the best and no active and sincere efforts toward bettering the conditions of food production can afford to be ignored. They would be strengthened by the oversight of the large number of local resident health officers.

How often are the large numbers of school children under our care ignored; their rights to sound bodies forgotten? Education is not all a matter of books. To the one-half blind, deaf, under-developed, ill-nourished child education is a torture. Little do we realize how remediable physical conditions affect the mentality of children. Criminals, degenerates, and the vast mass of those in public institutions at public expense, in a majority of cases, are there as a result of uncorrected pathological conditions existant in and from childhood. And still we wonder at crime! In the cities, in Rochester, such conditions of children are being sought out and cured. Adenoids and enlarged tonsils, mouth breathing, defective eyesight, defective dentition, deformities with their primary and remote reflex conditions are known to be responsible for large numbers of school children being classed as "slow," "stupid," "lazy," "ill-tempered," "ugly," "vicious," etc., and when corrected or removed, result in an entirely differ-

ent mental condition. They become receptive, studious, anxious to learn. This is not theory, it is a fact. To prove it ask many of the Rochester public school teachers, and to see the results investigate the Children's Dispensary of the Rochester Public Health Association. Are town or country children any different from city children? Are not their lives and health of as much importance? Are we as health officers doing our full duty by those under our care if we do not endeavor to institute some form of this work? Perhaps the conveniences are not so great as in the centers of population, but some way can surely be found. Vaccination laws should be enforced.

9 Medical school inspection in some form is vitally necessary in the towns and villages.

If the opportunity of this work is neglected, we cannot hope to have the people believe in the unselfishness of our work. It would increase their respect for us.

At present the majority of health officers are paid by the fee system. This is old fashioned and has become out of date in every other official position. Too often the conscientious man is held back from doing work for fear of being accused of increasing his fees or else often does work without remuneration. In either case it is wrong. The only proper remedy is to place the office on a salary basis. Not at the lowest salary, for some needy physician can be forced to do it, but at an amount which will properly remunerate an honest, active, intelligent, competent man. Under present conditions, the man who has no practice but plenty of time is not the best man for health officer. In emergencies the salary should be supplemented to meet the extra conditions imposed.

10 Remuneration for health officer should be by proper salary and not fees.

This would stimulate the honest, energetic man to do his best. No other sort of man has any place as health officer.

Sometimes, but let us hasten to say, not often, the position of health officer depends almost entirely on such local conditions as "pull." Once in, a man might be called on to influence his actions to the will of the appointing powers. Aggressors often feel aggrieved and develop a personal dislike for an efficient man. The

plan in operation of having the State Department concur in the appointment of local officers was a step in the right direction. Some way should at once be found to produce greater centralization in this office. Whether by concurrence or direct appointment; by county health officers or sanitary districts will have to be developed, but constant efforts must be kept up toward obtaining more ideal conditions. These will never exist until we have greater uniformity and systematic action and co-operation.

THE CHAIRMAN—This paper is open for discussion, and Dr. Frank W. Overton, of Patchogue, will lead in the discussion.

DR. FRANK W. OVERTON, of Patchogue—The first suggestion that I would make is that it would be far better to have these papers placed in our hands one week before we are to discuss them. Our rambling remarks might then be more brilliant had we time for preparation. The speaker has made some eminently practical suggestions along two lines. First, he suggests the work of legislation, beginning from the outside of the community, imposing upon the health officers, to have the people do certain things after the continental method. The legislation suggestion should be carried out, and the educational suggestion should be carried out also. I wish to emphasize one or two points which the speaker might have dwelt upon with more freedom.

The chief difficulty in the work of the health officer is not in the health officers themselves; they are pretty well up in their work, notwithstanding some of the remarks which were made to-day. I do not think the trouble lies with the people; they are "pretty ignorant;" and they should be accurately informed of what to do, when they are sick with contagious diseases—then they are unwilling to act, but they are willing to help you clean up their neighbor's yard, so I think the mere suggestion to 99 per cent. of the people is enough. I do not think it is so much with the doctors. Doctors are remiss in reporting cases. But suppose every suspected case of measles or diphtheria were reported. We would be busy all the time. I do not think the trouble lies there. I think the chief difficulty in carrying out our duty lies with the very method of procedure prescribed by the laws. And it is 1 or 2 per cent. of the people who are cranks, who are the ones who would give us trouble, and they are the ones who set the example for other smart alecks. We can suggest to the people, but if the people of New York State really knew how much power we had I think we would accomplish very little. The method of procedure in dealing with one of these recalcitrant cranks is, first, the inspection is made. The next step, if the suggestion is not carried out, is to make a report to the board, and they take firm action on it. That is supposed to be sufficient. "We shall do certain things," and it shall be a charge on the community, and those parties shall be subject to certain penalties. That is usually sufficient when they get that.

Now the health board has absolutely no power to enforce its own decisions. We have got to go to law and bring a civil suit to recover the expenses of carrying on a quarantine or a criminal suit as a misdemeanor.

Now you cannot bring a suit in a day. It takes about a week. Then you have to bring it before a jury, and by the end of that time public sentiment has cooled down and you do not get any convictions. I have tried it a number of times and never got a conviction yet. I have never heard of a conviction under the Health Law by local health officers. We simply cannot get the convictions.

The practical suggestion is this: I would disagree with Dr. Leary that local boards of health are no good. Suppose all this power was in the hands of the local health officer, he would have to be a judicial man to keep himself above suspicion. If the people do not carry out his instructions immediately then let the health board take a hand in it, and then let their decisions be

final. Of course, we have recourse to the courts, but I would not have it obligatory to go to court to enforce the rules. Give them the power to enforce the rules, and give the remedy to the citizen of applying to the courts where they abuse that authority.

THE CHAIRMAN — The next is Dr. Nickelson, of Adams.

DR. W. H. NICKELSON — *Ladies and Gentlemen:* I wish to indorse all that Dr. Leary has said. He has pictured very nicely the condition of the rural health officer. If there is anything that a rural health officer does not desire it is to be a health officer. We have heard it stated to-day and yesterday that our ordinary board of health was a farce. In most towns it certainly is. It all falls back on the health officer.

Now, when can a health officer, who is conscientious, and wishing to do his duty to himself and to his community, when can he enforce the laws without offending every physician in his locality? In a few years he will have more enemies than friends. Is this justice to the health officers in the State of New York? We are here, 1,400 of us. I, for one, could not do what the State Board of Health asks me to do, and what I think I could do, or should do, for \$2,000 a year. I must do the best I can and patch the thing up, and when I have put the patch there I am through.

I do not pose as a reformer, but there are a few suggestions that I would, as a rural health officer, like to make. Our present board of health—we had hard work to find three men—one of them moved away, and the time of the other one expired, and the consequence was we did not have a board for three months, and they appointed a board which tries to keep down the expense of our town.

He said: "We have not made much expense to the town or village." I said, "No, you have not." That was my answer.

Do away with your local board of health. There has been talk of sanitary districts. Give us a district deputy, and let him be a member of the State Board of Health; and then if we want a health officer, and perhaps a clerk, then, if we cannot enforce the law, we can call in this district deputy and let him proceed against these offenders. Then if you put a fee on every contagious case so that the attending physician can see to it that it is to his financial interest to report that case, I think he will report it. Then give the clerk a fee for recording it, and give him a good fee. Then if the fee is large enough, we will get a correct record and keep it. But do not ask the health officer to do this for nothing.

Now, is it justice to this Empire State to ask us to make this sacrifice? I for one stand here and say "No." But what must be done? We have an efficient State Department of Health, but it is handicapped for the almighty dollar. Pennsylvania hands out nearly one million dollars and Massachusetts hands out all the money they ask for, but we must go to every assemblyman and senator and ask them to give us something. We would a great deal better do that than help build this big ditch, I think, appropriate money for the State Board of Health to prosecute this work.

Millions we are spending there, but a few thousand dollars spent for our health or for the health of our community is too much. We should spend a little so that the health officer can be a conscientious man and not ruin his practice by trying to carry out the provision of the law in reference to these cases.

THE CHAIRMAN — That touches the keynote, gentlemen. Let us have a little more of that.

DR. C. C. VEDDER — *Mr. President, Ladies and Gentlemen:* I hope I shall not have the experience which one speaker had.

The question seems to be in a great degree: What is the sanitary officer to do to enforce the law? That seems to be the great point. It is not so much about how the law shall be enforced, and all that sort of thing, but what shall be the penalty when they do not comply with the law—when people insist upon doing as they please?

In regard to Dr. Leary's remarks, I can second the motion all along the line except for the abolition of the town board of health. If a health officer started to do this work alone, he would be accused of individualism — that he favors this family and that family, and puts it up to the others.

Now, my friend who got into a row with the old school-m'arm — we have many of those school-m'arms up our way. It has always been my first thought to do my duty as I saw best to do it, backed up by a good few resident citizens on the board. I think it is well to keep them there with us. We have their moral support.

Now we have a grand country, and to preserve the honor of that country, we have a Grand Army, and a Grand Navy, and so grand was our navy that it went around the world and did not lose one man. That is for the honor of the navy. Whoever heard of a lieutenant being arrested, or a captain, or a colonel, or a general being arrested for carrying out his orders and doing his duty? But we have heard of many health officers being threatened with arrest when they tried to do their duty.

Now we can establish a law directly from the State, imposing a fine on these refractory people, and fine them, and let that fine go to the support of the Board of Health.

THE CHAIRMAN — I was sure the doctor would make a hit if we got him up here.

DR. HUGH HALSKY, Southampton — Dr. Leary, in his admirable paper, is looking forward to ideal conditions, or at least hopes for them. But great changes will have to take place before local boards of health will support or pay their health officers for such services.

Trying to influence legislation, I believe, should come entirely through the State Department of Health. Few can have any influence unless they control votes, and when politics get in health matters we can never look for ideal conditions.

It would be interesting to know just how many local boards of health really favor anything much more than attention to quarantine, and other methods used to suppress contagious diseases. Inactivity saves the town expense, and the board much trouble, and generally, criticism. Health officers knowing all this are obliged to go slow. All, probably, have been much troubled with complaints of nuisances that are inspired by personal animus, and with reports, statistics, investigations, and general missionary work, cause much trouble, for which we receive little pay and no thanks.

In conclusion wish to state that in my opinion more pressure upon local boards of health by the State Department, and some education would induce a healthy activity that would help wonderfully, and would no doubt save the State Department much money by having detail work done by and at the expense of the local boards.

THE CHAIRMAN — That concludes the list of printed speakers down for discussion of this paper. Now, we will open a five-minute discussion on this paper.

DR. SINCLAIR — A case of scarlet fever was quarantined by myself, and the next day the man of the house, who was quarantined with it, deliberately went off to an auction sale and stayed all day. I heard about it the next day and called upon him, and he said "Go to grass" — well, if it wasn't "grass," it was to go somewhere.

I am proud to say that my board of health stands by me. The other member is the law member. He was a justice of the peace, and I presented the case to him and he said, "I will give him a talking to." He rung him up by telephone, and the man said to him, "You go to grass," or elsewhere. Then we reported the case to the supervisor, and he told the supervisor to go to grass, too. He was staying in just then, and I anticipated that something would be done if we got the whole town board after him. But nothing was ever done, and I guess we all "went to grass."

Now, whose duty was it to prosecute that case? Was it mine?

Another question: Suppose I had brought this man before the justice of the peace, the member of the board being the justice of the peace, isn't he an interested party, and is he competent to pass on the case?

DR. WARNER—*Mr. Chairman and Gentlemen:* I have been greatly interested in the reading of the paper and the discussion, and necessarily have formed some ideas as to the general design of the paper, and the discussion which follows. It is evident we have before us a condition, and the question is, whether we must meet that condition, or, whether by legislation, we should seek to change it. To my mind, the best way is to see what we can do with the present conditions. We have a Department of Health, and our health officers in all of the towns of the State.

Gentlemen, I admire the profession to which I belong, above any other class of men with whom I am acquainted, and I also admire throughout my acquaintance the gentlemen who make up the various boards of health in Cattaraugus county. I believe as a class they are good men. But, there is this situation: In that county, as elsewhere, a health officer is the only man posted on the Health Law. Now, what we need to do is to get sufficient enthusiasm in every health officer, and inspire his board with the same feeling that he has in the work which they have to do, together. If that is made in a proper manner, with tact on the part of the health officer, it will meet with proper reception on the part of the board.

But if a man with a desire to be imperious, thinks to extort from them things which they might do without a fair explanation, he will meet a rebuff. If he goes at them with a fair argument, and with the statutes in his bag, so that he can explain to them the conditions of the case, they are with him. I take it that ninety times out of one hundred, the health board will be with the health officer. With that support, we will succeed. Where else can we better look than to those men known for years as the health officer of the town for support. I do not say that proper men are always chosen to fill those positions on those boards. But if the health officer approaches the matter fairly, he is doubly armed for the fight. Don't do away with the health board.

DR. J. W. KING—I have been a health officer more or less for a number of years, and I was pleased when I heard Dr. Leary's paper presented. There is, as you all know, much with which anybody will differ in anything. It would seem to me that one thing that might be taught to the people, is that quarantine: that when we say "scarlet fever is there" that there might be perhaps some circular which we could hand in to them about such diseases. That would save a great deal of time and discussion with the family, as to how long they were going to be kept in quarantine if they had a mild case of any communicable disease. That is one thought.

There is another thing which should be imposed upon the health officer, and not be optional with him, and that is the obligatory condition by which he should report when he knows there is an infraction of the law on the part of those who are quarantined.

When the people know it is obligatory upon him, and he would be fined if he did not do it, then they would not accuse him of being mean to this or to that particular family. Suppose a complaint could be reported to the clerk of the board, and it would be compulsory on the clerk to call the board together, so that means should be taken to properly control the situation, and by fine, punish the breakers of the quarantine. That would seem to cover it.

DR. CARR—I was very much interested in the discussion this afternoon, of Dr. Leary's paper, but we are losing sight of what seems very important, and that is, the education of our people, and the co-operation of our associate physicians. That is where the trouble pinches in this question of reporting cases and quarantining and carrying out a great many unpleasant things. I find that some of the physicians say: You will have to be quarantined, but it is only for a few days, and then the quarantine can be removed. You all understand what that means when a case is to be quarantined for two or three weeks, or possibly four weeks. The family feels you

are maintaining a quarantine where it is not necessary because their physician has told them so. Let us see that our associate physicians are dealt with fairly, so that they will not handicap the health officer, and also have them work with you in educating the laity into the conditions surrounding you. Then we will have a more uniform condition and easier work for those caring for the health and welfare of a community. Education and co-operation, Mr. Chairman, seem to be the important point.

DR. COLE—Two ideas have occurred to me out of the discussion this afternoon. One gentleman has asked a question which has not been answered. I am not going to answer it. I am not learned in the law, and I doubt if there are any of us here who want to answer a question of that character off-hand. But as I have charge of the Municipal Bulletin of the State Department of Health, I want to say it is our desire to open in the Monthly Bulletin a page or more, if necessary, for the answering of just such questions as are proposed. And I will ask that every health officer with a complaint shall put it in the form of a letter to the Department, addressed to the Commissioner or to the editor of the Bulletin. I will see that it is answered in the Bulletin, and that answer will be of value to him and to other health officers in the State who wish to get the same information which he wants.

Another health officer has suggested that the Department should issue a circular upon some particular topic which he would be glad to distribute among the particular people in his community. I want to say that I hope every officer who can make a suggestion will write it to the Department. We want to issue a series of these pamphlets, which will be of benefit to you in your work, and if you will be so good as to tell us all topics which will be of advantage to you in your particular field, we will be glad to take them up, as far as our means will allow.

THE CHAIRMAN—We are fortunate in having with us the father of the State Rural Bacteriological Laboratory in the United States. That is a fact. The next speaker is the father of State Rural Bacteriological Laboratory in the United States, and I am more than pleased to have with us Dr. Hallenbeck, who has had several years of practical, useful experience of that kind in Ontario county.

COUNTY SANITARY ORGANIZATION

BY O. J. HALLENBECK, M.D.

Health Officer, Canandaigua

About six weeks ago I received a letter from Dr. Porter saying that I was to read a paper on the subject of "County Sanitary Organizations." There was nothing to do but to obey. I do not wonder why he asked me to write on this subject, as I understand he has been plied with many questions in regard to the county laboratory and to the county sanitary association. Here is a sample of an inquiry we received from an interested party last week. This is addressed to the Bacteriological Laboratory in Canandaigua:

"Dear Doctor:

SIR:—I cannot attend the meeting in Rochester in November. Dr. Floyd Palmer, health officer, who is also interested in county laboratories will be present, and I will call his attention to that portion of the program indicated.

In talking over the matter to our people, I have been asked to show the results in some county where the laboratory has been established. The majority of the people here do not appreciate work of this kind, and it is rather hard to get started."

Now, the way we got started was to start. It was during an epidemic of diphtheria in the winter of 1905-6 at the Ontario County Orphan Asylum that I became especially impressed with the inadequate means at our disposal of waging war against the enemy. The State Department at Albany was ready and willing to give us the bacteriological examinations of those cases that came within its jurisdiction, but our base of information was too remote to give us in time that scientific information which was due us both as physicians and patients. This epidemic was stubborn and expensive. I became convinced that a bacteriological laboratory and a competent bacteriologist near at hand would be potent factors in subduing the epidemic. I studied the problem also from a financial point of view, and I became convinced that if every county in the State had its own bacteriological laboratory, and used it

only in diagnosing diphtheria, tuberculosis and typhoid fever, it would be a profitable investment for its taxpayers. The citizens of the county are the beneficiaries, therefore the expense should be borne by them, through their board of supervisors. Gentlemen, you are the ones who are to educate the people in these matters.

Are we leaders or are we being lead? Are we being pushed along by the demands of the age in which we live, grasping only at the thorns that are thrust at us, prodding us on to duty, or are we vigilant and far sighted to anticipate the necessities that are in the not far distant horizon? The position of health officer is a position of opportunities. By virtue of the office which is held by him, he is frequently called upon to discharge duties that are not agreeable, but are of vital importance. Questions bearing on the liberties and the rights of people have frequently to be decided at once. To err in judgment may be to permit an epidemic to spread, or on the other hand to quarantine unnecessarily. When personal rights are interfered with, or changes are directed involving a monetary consideration, the health officer is often strenuously antagonized, although an epidemic may be averted or an insanitary condition remedied, much to the benefit of the party interested.

Good, mature judgment, together with the executive ability to carry out the conclusions arrived at, are the prime requisites of a successful health officer. Since we have so many different and difficult duties to perform, where so many parties are vitally interested, even to the extent at times of depriving them of their liberty, confiscating their property, or compelling them to expend money to abate a nuisance, we would be stronger officials if we could be schooled by the views and experiences of our co-laborers.

In order that this course of reasoning might be carried out to fruition, two things it seemed were necessary, viz.: We must have a County Sanitary Association, and a county bacteriologist. Ways and means were instituted to effect the former organization.

The matter was first brought up before the Society of Physicians of the village of Canandaigua in January, 1906, and also before the quarterly meeting of the Ontario County Medical Society in the latter part of the same month. The propositions were

fully and thoroughly discussed and approved. A committee from each society was appointed to proceed on the plans discussed.

A letter was sent to each of the nineteen health officers of the county to meet in Canandaigua, March 4, 1906, to organize a county sanitary association. At this meeting we did organize, adopt a constitution and by-laws and elect officers.

At the February session of the board of supervisors the committees were given a hearing. We were there in full force with our plans definitely mapped out on paper. We illustrated by individual cases where time and expense would often be saved by knowing when and how long to quarantine, as well as being of inestimable value to us in preventing the spread of many diseases. To know that good and wholesome milk and water are furnished to a community; to know that diphtheria is not tonsilitis; to know that tuberculosis is not bronchitis; to know that typhoid fever is not remittent fever or some infection; to know that malignant growths are not benignant, etc., can be positively known only when we have the information made known to us by a bacteriological examination. We emphasized the fact that the greatest asset to any community is good health. We assured the board of supervisors that we would build and equip a laboratory, if they would at least pay \$1,500 annually for the salary of a bacteriologist.

We explained to them that this laboratory was for the benefit of the citizens of Ontario county, and the services of the bacteriologist would be free to them in all matters pertaining to the public health. When the individual alone is the one interested or benefited a small fee would be charged. For all examinations and analyses made for parties outside of the county, a charge would be made. This income was to be paid monthly to the county treasurer, and would be the fund to maintain the running expenses of the laboratory.

We also explained to them the fact that the county sanitary association as organized, would hold meetings quarterly at which times papers would be read and discussed that pertain more particularly to educate the people in sanitary matters and wholesome living. That we would encourage the public to attend the meetings, in order that they may be educated with respect to

the nature and prevention of disease. That our constitution provides that the executive committee from this association shall have general supervision of the bacteriologist and the laboratory. It would recommend to the board of supervisors a bacteriologist for their appointment. It would inspect the laboratory from time to time and acquaint itself as to the quality and quantity of work done and judge as to the competency or incompetency of the bacteriologist. It would require him to make reports to the board at such times as it ordered, etc.

During this session the vote was taken, to provide the salary for a bacteriologist, which was unanimously carried, if the county sanitary association would carry out the plans outlined.

In short, we now have a county sanitary association which meets quarterly, at which time one or more papers are read and discussed that pertain more especially to contagious and infectious diseases, hygiene and sanitation. Every health officer of the county is a member of the association by virtue of his office, and physicians may become honorary members by paying \$1 annual dues. The dues for each health officer's district is \$1 payable by the health board, through its health officer.

Our laboratory is a one-story building, built of wood on a Medina stone foundation, size 12 by 20 feet, and located on the grounds of the Memorial Hospital building. It is heated by steam, lighted by electricity, supplied with gas, hot and cold water, equipped with incubator, sterilizer, section cutter, microscope, etc., and other modern paraphernalia that goes to make complete a first class bacteriological and pathological laboratory.

The building cost about \$1,000 and the cost of the equipment about \$400.

I append to this paper the third annual report of the bacteriologist to the board of supervisors, as a summary of our work for the past year.

THIRD ANNUAL REPORT OF THE ONTARIO COUNTY LABORATORY

CANANDAIGUA, N. Y., *October, 1, 1909.*

To the Honorable the Board of Supervisors of Ontario County:

GENTLEMEN: — I have the honor of submitting to your honorable body, the following report of the Ontario County Laboratory for the year ending September 30, 1909.

Building Equipment and Supplies

The building used as a laboratory has begun to show some signs of wear, viz: the putty has fallen away from some of the window panes, and the frames of the windows need paint. The plastering inside shows the accumulated smoke and dust of three years, and would be improved with washing. Aside from these minor particulars the building is in good repair. A new screen door should be supplied, as the one now in use is badly warped and can not be tightly closed. It will be seen from the financial report that there is sufficient money at hand to defray the expense of these repairs. There have been no additions to the permanent apparatus, and no repairs needed. Supplies of glass, chemicals, etc., have been purchased from time to time, and there is money at hand to pay all bills so incurred.

Financial

The balance to the credit of the laboratory at the last annual report was \$23.47. The receipts for the past year have been as follows:

October, 1908	\$6 20
November, 1908.	4 00
December, 1908.	12 25
January, 1909.	11 85
February, 1909.	20 00
March, 1909.	10 25
April, 1909.	14 30
May, 1909.	5 25
June, 1909.	18 25
July, 1909.	10 75
August, 1909.	19 85
September, 1909.	12 00

Total \$144 95

The expenses were as follows. At the February session these bills were audited and paid:

Bausch & Lomb (supplies)	\$30 50
H. I. Davenport (supplies).	16 88

Total. \$47 38

At the present session are presented the following bills, viz:

Bausch & Lomb (supplies)	\$20 31
H. I. Davenport (supplies).	64 75

Ont. Co. Messenger (printing).....	\$1 75
McGrevy Sleght DeGraff Co.	5 15
Total.	<u>\$91 96</u>

Summary

Balance on hand October 1, 1908.....	\$23 47
Receipts for the year.	144 95
Total.	<u>\$168 42</u>
Expenses for the year.	139 34
Balance October 1, 1909.....	<u><u>\$29 08</u></u>

Accounts are due the laboratory to the amount of \$80.00 of which \$55.50 is owed by Yates Co. under our contract with them, and this amount is to be paid at their November session.

The total charges for the work done this year are \$197.25 as against \$153.95 last year, a gain of \$43.30 or a fraction over 28 per cent. The expenses on the other hand were \$2.27 above last year. Less than 2 per cent. increase.

A table is appended to this report, showing the number of specimens, the nature of such specimen, and the address of the physician sending the same. As a part of this report the complete data and finding in the instance of each specimen received are on file at the laboratory. The total number of specimens this year is 825, only a slight gain over last year. The work done for physicians outside of the county has largely increased.

Respectfully submitted,

H. I. DAVENPORT,
County Bacteriologist

Sputum tuberculosis, positive 71, negative 215.

Blood typhoid, positive 40, negative 55.

Other blood examinations, 47.

Diphtheria swabs, positive 24, negative 68.

Urine, 142.

Bacteriological, 64.

Pathological, 42.

Water bacteriological, 30.

Milk bacteriological, 7.

Milk chemical, 3.
 Faeces, 4.
 Chemical, 4.
 Stomach contents, 4.
 Unclassified, 3.
 Total, 825.

DR. BRYAN — I will not be able to discuss this paper, as my voice will not permit me.

DR. MAGILL — *Mr. President, Ladies and Gentlemen:* I was delighted to hear the paper of Dr. Hallenbeck. My short acquaintance with Dr. Hallenbeck dates back only to a very enthusiastic affair which we once attended. I think he is an ideal health officer because he is an optimist. I want you to know you have not heard anything from Dr. Hallenbeck about his difficulties. He has showed you how to do things. The observation of my life has been to see how men do things, and the men that I admire are the men that do things. I admire the German organization, where I have been trained, and the French organization where I have been trained, because of its military power. Every inhabitant of those nations is trained to efficiency and discipline — you have the order and you do it. It seems to me that the accomplishment of the order is an exceedingly simple thing. It accomplishes results and clears your conscience.

Now, on this laboratory question, the first question I asked Dr. Hallenbeck was: "How did you organize your county laboratories, and how many county laboratories have you in the State?" I think I am correct in saying there are three or four county laboratories in this State now. Dr. Bryan reports the spreading of that thing in his county at this time. I have been encouraged to have inquiries coming into the State Department asking how to start a county laboratory, and I would like to ask every health officer: What have you done to secure a laboratory in your county, and what are you going to do? I think every health officer realizes the great assistance to him in his work of such a laboratory. The trouble is they are not all gifted with this genius for organization, and he has come to show you how to do it. I do not think any county laboratory in this State is free from Dr. Hallenbeck's contact. And, as Dr. Hallenbeck has been here and told you how to do it, I hope every county will secure a county laboratory during the course of this year.

THE CHAIRMAN — We will listen now to five minutes' discussion of Dr. Hallenbeck's paper.

DR. W. G. FISH — We heard from Prof. Ogden sometime to-day of the laboratory at Cornell University for his section of the State and, if I am not mistaken, Prof. Ogden said the Department was to use this laboratory as a starter for other laboratories in other sections of the State; are we not going to duplicate unnecessarily if we have county laboratories, too?

THE CHAIRMAN — Dr. Hallenbeck will answer that.

DR. HALLENBECK — We are now in the preventive stage of medicine. Now it is up to us to prevent disease, and that is what this laboratory is for. We are getting off too far if we go to Cornell for our information. To illustrate, we had one case which came to our laboratory, a school teacher that was sick, and the doctor reported "sore throat," and she was up and around. We took a culture in the morning, and at night the result was announced from the laboratory, she had diphtheria. The family did not think we were correct. I was going to take her to a hospital and quarantine the house, when she went to a hospital, and in less than ten days she died of diphtheria. Suppose we had let that case go without quarantine. You take those chances. The only way to get at those things is to get at them correctly.

DR. MAGILL — The laboratory alluded to by Prof. Ogden is merely a portion brought for special study. At the present time that is only equipped for water supply tests, and the hope Prof. Ogden held out was that they would fill the need of that locality. But the real object of this laboratory is to start out the particular work of the State and not to answer the needs which the county laboratory fulfilled.

THE CHAIRMAN — Are there any other questions, or is there any other discussion?

DR. CARR — I am within ten miles of Cornell University, and last year we had a small epidemic of diphtheria and I took cultures from those throats, and I could not wait for results from Albany. The epidemic started from two or three cases. The physician said: "You had better report these to the health officer." I went there and took the cultures and, instead of waiting for Albany, I sent them to Cornell University, and I got results by telephone in the afternoon. That shows you the advisability of having your laboratory near at hand.

THE CHAIRMAN — I will ask what Dr. Hallenbeck can tell us about Ontario county?

DR. HALLENBECK — We have a tuberculosis hospital plan; the plans were submitted once to the board of supervisors, and the board of supervisors has had an estimate made by the architect, but the price was too high and it was resubmitted.

I have not very much doubt that this is the result of the sanitary organization of the county. I do not believe it would have been brought about as readily as this if we had not had this organization. You know, if you have a reason and you can show your people that you have something for their benefit, and you are a unit, you can carry almost anything.

Our board of supervisors said: "We will give you \$15,000 for your hospital." A site has been selected and paid for and we expect to have the building ready in the spring. You cannot afford to stand alone. Get all the health officers of your county around you and work together.

THE CHAIRMAN — I declare this meeting formally closed until 10 o'clock tomorrow morning.

FRIDAY, NOVEMBER 12

FIFTH SESSION, 10 A. M.

Presiding: COMMISSIONER EUGENE H. PORTER

THE CHAIRMAN — I take great pleasure in introducing to you Surgeon-General Walter A. Wyman, of the United States Public Health and Marine Hospital Service, who I am sure will present the subject which he has chosen in a most interesting and instructive way.

SURGEON-GENERAL WALTER A. WYMAN — *Mr. President, Ladies and Gentlemen:* In the course of my remarks I am going to refer to the hygienic laboratory of the Public Health and Marine Hospital Service, and also the Leprosy Station on the Island of Molokai in the Hawaiian Islands. In order that you may understand what I have to say about these two institutions I will pass these photographs around, and request that the last to receive them will return them to the secretary.

In dealing with this subject I have concluded that I could find no better way of giving the desired information than to simply give a review of the work of the Public Health and Marine Hospital Service for one year — last year.

The matter which I have prepared for you has never been published, and it is entirely new and I hope it may interest you. I may seem a little dull in rehearsing this, and yet it seems to me every topic touched upon must be of interest to the members of this association. In describing what we have done also, it will give to you an idea of how it is done, and the operations and the law under which the Public Health and Marine Hospital Service carries on its work.

I first deal with the subject of plague in California and on the Pacific coast, which for the past two or three years has been a very vital matter with us. You will remember in 1900 there was an outbreak of plague, and a number of deaths therefrom in San Francisco, and the Public Health and Marine Hospital Service was called upon to assist, and finally the plague was thought to be eradicated, but after the great fire in San Francisco, and the earthquake, it broke out again, and we were called upon to resume the full charge of its suppression, the State and local authorities rendering their valuable aid. We have been successful in eliminating the plague from the city of San Francisco, but the work is still going on, as the work is the most difficult of any type of diseases to root out. You may go for months and months without a case, and it will require years more of constant work taking away rats, and now and then catching an affected one, and now and then a ground squirrel, before we can be assured that the plague has been eradicated.

During the last year there was but one case of rat plague, and that was in October, 1908.

WHAT THE FEDERAL GOVERNMENT IS DOING FOR PUBLIC HEALTH

BY WALTER A. WYMAN, M.D.

Surgeon-General, U. S. Public Health and Marine Hospital Service

In considering the subject assigned to me on the program I know of no better way of treating it than by describing the activities of the Public Health and Marine Hospital Service during the past year. I have prepared, therefore, a summary of transactions which will not only show the work that has been done, but will give an idea of the field covered and methods of operation.

First, with regard to bubonic plague on the Pacific coast. You will remember that in 1900 plague was announced in San Francisco, and that for four successive years the service and the State and local health authorities were engaged in its elimination. There were in that period 119 cases and 113 deaths. Examination of rats continued for quite a long period after the cessation of the disease among human beings, and finally operations were brought to a close; but following the earthquake and fire in San Francisco in 1906, cases of plague began to be reported. A fatal case of human plague was reported in San Francisco in May, 1907, and an active anti-plague campaign was begun at once, and has continued to the present time. To June 30, 1908, there were in that city 159 cases of human plague, with 77 deaths.

During the fiscal year 1909 no further cases of human plague occurred in San Francisco, and but four cases of rat plague, the last occurring October 23, 1908.

The operations of the service in San Francisco included the inspection of 5,681 persons, investigation of 344 cases of illness, and 96 necropsies. The rats caught numbered 156,059, of which 93,558 were examined. The premises inspected numbered 365,925; buildings disinfected, 4,572; buildings made rat-proof, 846; and nuisances abated, 48,299.

The effect of this work with state and local co-operation, has been to place San Francisco in a satisfactory sanitary condition.

In Oakland, beginning with September 12, 1907, eighteen cases and twelve deaths have been reported, but no human plague has

occurred since July 17, 1908, and no rodent plague since December 1 of the same year. The number of cases of sickness investigated during the fiscal year was 170, and number of necropsies, 65. The rats caught numbered 25,889, of which 16,593 were examined, and 2 found to be infected with plague. The premises inspected numbered 2,550, and the buildings disinfected, 4,289.

At Los Angeles, on August 11, 1908, a case of human plague was reported, and shortly afterwards a ground squirrel was found with plague infection. A service officer was detailed from the hygienic laboratory to take charge of the laboratory provided by the local authorities. Between September 24, 1908, and April 12, 1909, when the medical officer was withdrawn, 13,922 animals were destroyed and examined for plague infection, including 4,722 ground squirrels and 8,977 rats. None were found infected.

In Seattle, Washington, during the fiscal year, 51,750 rats were caught, and 48,652 examined. There was no case of human plague, but 10 rats were found infected, the last one September 26, 1908. There have been in all but 3 cases of human plague discovered in Seattle since the appearance of the first case October 16, 1907, the last case occurring October 25 of the same year.

PLAGUE AMONG GROUND SQUIRRELS

In April, 1909, investigation revealed a widespread infection among ground squirrels in Contra Costa county, California. It is believed that no portion of Contra Costa county, which is some 744 square miles in extent, is free from this infection. About May 1, 1909, an organized campaign was inaugurated by the service for the destruction of these animals under the charge of a commissioned medical officer. Inspectors, foremen and laborers to the number of thirty, visit the infected ranches and with local co-operation engaged in the destruction of the squirrels by poisoning and shooting. Bulletins published by the bureau, containing all necessary information, are at the same time distributed. There have been to October 9, 34,000 squirrels destroyed, of which number 286 have been found to be infected. The warfare has been extended to adjoining counties, and an average of 300 squirrels a day are being destroyed. Four thousand, one hundred

and twenty-six ranches have thus far (October, 1909) been inspected. It will be necessary to continue this work for an indefinite period until all this plague infection has been eliminated.

PLAGUE IN OTHER COUNTRIES

Plague has markedly diminished in India. For the fiscal year 1909 there were but 168,403 cases, as against 730,729 for the previous fiscal year, and more than 1,022,000 for the fiscal year 1907.

In South America the situation remains about the same as a year ago, the disease still existing in Ecuador, Peru, Chili, Uruguay, Brazil and Venezuela. No cases were reported from Argentina. In Peru 1,192 cases with 560 deaths have been reported. In the West Indies, Trinidad was afflicted with 18 cases, 14 being fatal. The menace to the United States, therefore, still continues. Of special significance to the United States also were the outbreaks of this disease in Fayal and Terceira in the Azores Islands. Unceasing vigilance will be required in quarantine administration to prevent the further introduction of this disease. Medical officers are on duty at Guayaquil, Callao, Rio Janeiro, and La Guira, and special instructions have been issued for close quarantine surveillance and for the destruction of rats aboard vessels.

TYPHOID FEVER

Three years ago the commissioners of the District of Columbia, on account of the continued prevalence of typhoid fever in Washington, requested the Public Health and Marine Hospital Service to make an investigation to determine the cause of this continued prevalence. A board was therefore appointed, and has just completed its third report, known as Hygienic Laboratory Bulletin No. 52. The board is still investigating, and will make a fourth report, which will terminate its labors. The investigations thus far made indicate that somewhat less than 10 per cent. of the cases of typhoid fever are definitely attributed to infected milk.

The three years' study have shown that in 1906, infected milk, contact, and imported cases accounted for 30.93 per cent. of the cases for that year, 48.46 per cent. for 1907 and 46.76 per cent. for 1908. The board states that it does not seem probable that

for the seasons 1907 and 1908 Potomac water could have been directly responsible for much, if any, of the infection, and there is not yet sufficient evidence for positive conclusion as to just what part this river water has played in the causation of the disease in previous years. They call attention to the frequent neglect of disinfection of excreta, and the need of legal control of typhoid fever patients, and typhoid bacillus carriers, and the necessity in general of treating this disease as a contagious disease.

These reports have an additional value in presenting a standard method of investigating the causes of the prevalence of typhoid fever in a city, which standard has already been followed by the cities of Richmond and Pittsburg. Results obtained in the different cities from operations on the same plan become comparable and of greater practical utility.

The spread of typhoid fever through the pollution of interstate waters, particularly the Great Lakes, is an important sanitary problem, requiring Congressional legislation. The service is represented by one of its officers on the Lake Michigan Water Pollution Commission, and its advice and assistance has been requested by the Niagara Frontier Pure Water Conference.

TUBERCULOSIS

The service was adequately represented in the Sixth International Congress on Tuberculosis, at Washington, September 28 to October 5, 1908, both in the administrative and scientific work, and the exhibit.

In the laboratory the presence of the tubercle bacillus in the market milk of Washington has been demonstrated, and its thermal death point determined, (60° C. for 20 minutes). Experiments to determine whether the bacillus can be recovered from the blood of affected persons have given negative results. These studies are reported in Bulletin No. 57.

Under executive order of February 26, 1906, Departmental employees have been examined for tuberculosis and certificates given.

The service has given advisory support to the Colored Anti-tuberculosis League, established, at the suggestion of one of its officers, by the colored people of the South. A working plan,

together with the constitution and by-laws and form of membership certificate, has been published in the Public Health Reports, and the movement, which now embraces seven southern States, promises good results.

At Fort Stanton, New Mexico, where the service has a sanatorium for the treatment of tuberculosis cases, with a reservation of 46 square miles, 399 patients have been cared for during the year.

While, of course, it is known that the outdoor treatment anywhere is efficacious, still the climate, the altitude and dryness of air at Fort Stanton render it particularly available for the care of these cases. But there is more than a mere care of cases in the sanatorium idea. The patients in this institution come from the merchant marine of the United States, and by being sent to Fort Stanton are removed from the forecastle and boarding houses and hospitals where they would undoubtedly infect others.

While great care is exercised in stating that patients are positively cured, we have had undoubted evidence to that effect, as illustrated by the following: Sometime ago two patients who had been discharged as absolutely cured from Fort Stanton were admitted, one in the Marine Hospital at Boston, and the other at the Marine Hospital at Chicago, for diseases entirely distinct from tuberculosis, and from which they died. The medical officers knowing that they had been discharged as absolutely cured of tuberculosis were careful in the post-mortem examinations, and found that there was absolutely no active pathological condition in the lungs. The healing had been complete.

RABIES

An investigation has been made to determine the prevalence of rabies in the United States, and its geographical distribution.

During the calendar year 1908, there were 111 deaths from this disease and 534 infected localities, as shown by reports of rabies among animals. The disease prevailed in 36 States and Territories and the District of Columbia in the eastern three-fourths of the United States. No cases were reported from the Rocky Mountain and Pacific Coast regions.

During the fiscal year the Pasteur treatment was administered to 130 persons at the Hygienic Laboratory. The "fixed virus" there prepared was furnished from time to time for use in the canal zone, and was sent to the health officers of several States. A bulletin on rabies, giving the results of these investigations and operations, has been published.

PELLAGRA

Pellagra, a disease which has prevailed in certain parts of Europe for more than a century, has recently been reported from various parts of the country, notably the southern States. Its apparent increase and severity and its suspected relationship to diseased corn, make it a matter of great concern and economic importance.

A year and a half ago, recognizing that this disease was to become one of national importance, a special officer was detailed for this investigation, giving his whole time to this one disease alone, and four bulletins prepared by him on the subject have been published by the bureau, and statistical information is being obtained. Within the past month, the investigation has been broadened by the appointment, with the approval of the Secretary of the Treasury, of a special commission for the investigation of pellagra, this commission consisting of seven members, five of whom are connected with the Hygienic Laboratory of the service, and two connected with the large government hospital for the insane, St. Elizabeth's, at Washington. Insanity being a frequent accompaniment of this disease, the superintendent of St. Elizabeth's was appointed on the commission, and also one of his assistants, especially noted as an expert in nerve pathology.

HOOKWORM DISEASE

Four pamphlets upon the subject of hookworm disease have been published, and an officer, who has specially investigated this disease, has been detailed to address several public health and medical associations on the subject.

Failure of requested legislation has prevented a campaign of education in conjunction with the State boards of health, which had been contemplated.

A report on hookworm disease in its relation to child labor, requested by the Secretary of the Department of Commerce and Labor, has recently been completed. This report was prepared by Dr. Ch. Wardell Stiles, Chief of the Division of Zoology, of the Hygienic Laboratory. His conclusions on the subject of child labor in the South are not in harmony with those popularly entertained. He is of the opinion that this subject involves questions which give to it an aspect quite different from that of child labor in the North, and his conclusions can best be summarized by his statement that if he had to choose between placing his own ten-year-old daughter in the spinning room of a cotton mill and placing her on the average small tenant farm of the South, he would be obliged in the best interest of the child to send her to the mill. In 1902, when Dr. Stiles pointed out the widespread prevalence of hookworm disease in the South, his views were regarded by some as extreme, but to-day it is generally admitted that those views were correct, and there are gratifying indications of a popular awakening of public sentiment which will eventually lead to an improvement in the sanitary conditions.

During the present fiscal year, Dr. Stiles has inspected 26 factories in New England, including 16 cotton mills and 1 knitting mill, but in an examination of the 1,437 cotton mill hands seen, he has failed to find a single case of that severe type of anemia (known as cotton mill anemia), which he found in 12.6 per cent. of the cotton mill hands of the South. As the New England mills are using southern cotton, and as the mill hands are therefore breathing in the same kind of lint as the southern cotton mill hands, these observations give an additional proof of the error of the popular idea that the condition of the latter mill hands is due to the breathing in of lint. Such an array of data is now on hand, not in harmony with the lint theory, that when all facts are published, he believes public opinion on this theory will of necessity undergo a change.

Hookworm disease is entirely due to soil pollution, and in order to awaken popular interest in the subject of soil pollution in connection with the disease, Dr. Stiles, in connection with his other duties, has been given several details to lecture on the sub-

ject. In addition, he has given twenty-five popular and technical lectures on this subject in five States, and without expense to the government.

While the eradication of hookworm disease within a State is primarily the duty of its sanitary authorities, nevertheless, on account of the widespread distribution of the disease and its baneful influence on the population of the country as a whole, the Federal Government should co-operate with State authorities, and this co-operation should include especially a widespread campaign of education regarding the measures necessary to prevent the transmission of hookworm disease and treatment of the large number of persons afflicted in different sections of the country.

The gift of a million dollars by Mr. Rockefeller, and the appointment by him of a commission for the purpose of eradicating this disease is a matter of a great import. It should be remarked too, that Mr. Rockefeller's noble gift is not restricted in its use to the interest upon an endowment, but that it provides for the expenditure for five years of \$200,000 each year.

One of the members of this commission is Dr. Stiles, who has devoted himself assiduously to this subject, and who is chief of the Division of Zoölogy in the Hygienic Laboratory.

LEPROSY

In 1905 Congress appropriated \$100,000 for the erection of a leprosy investigation station on the island of Molokai in Hawaii. Great difficulty was experienced in erecting the buildings, on account of the difficulty in securing labor, caused by the fear of the disease. The investigations, however, were begun in the temporary laboratory in Honolulu. The station at Molokai, some 60 miles distant, is now completed and is about ready for occupancy.

The results obtained thus far in the investigations made at the receiving station in Honolulu are embodied in six reports, which have been published.

The investigation of incipient cases at Honolulu will continue even after the main station at Molokai is opened, as such cases present the best opportunity for the study of early methods of diagnosis and best means of relief. Studies are being made of the

pathological anatomy of the nasal cavity in leprosy; treatment of incipient cases of leprosy with tuberculin, atoxylol, strychnine, chaulmoogra oil, and cinimate of soda; examination of the urine of lepers for acid-fast bacilli; and attempts to grow the lepra bacillus on several media.

On the other hand, experiments on animals and such other work as requires large amounts of leprosy material can best be carried on at the station on Molokai, where the service has full control of the patients under its care. Both lines of investigation are of importance; each assists the other and together they form a comprehensive plan that should bring about results for which the investigation was begun.

The many problems that leprosy presents has for convenience been grouped into two classes:

The first class includes four important problems, namely, the growth of the lepra bacillus on artificial media; the successful inoculation of the lower animals; the discovery of a substance analogous to tuberculin, of use as a remedial or diagnostic agent; the discovery of the usual mechanism whereby the infection spreads from one person to another.

In the second class are included lesser problems that step by step add to our knowledge of the disease, and while not apparently of so great immediate importance, yet may indicate the path that leads to the solution of the greater problems mentioned.

The investigations inaugurated have for their primary object the solution of the greater problems mentioned, but it is realized that scientists in many lands have sought in vain for their solution, and years may elapse before success is attained.

If, however, efforts were thus confined, the station might continue its work for years without obtaining results worthy of publication, and the greatest utility to the sanitary and scientific world would not be subserved. Every effort will therefore be made to throw all possible light on different phases of the leprosy problem, and it is expected that results will be obtained from time to time that permit of positive opinions and announcements.

With a well equipped station and laboratory, an abundance of clinical material, and a well trained corps of scientific workers, it is reasonable to expect that interesting and useful knowledge bearing on leprosy will be obtained.

The service was represented by the director of this station at the Second International Congress Against Leprosy, held in Bergen, Norway, August 16-19, 1909, and his report has been published.

YELLOW FEVER

There has been no yellow fever in the United States, and a marked absence of this disease during the active quarantine season of 1909, in Cuban, Mexican, West Indian, Central and South American ports. This great improvement in the yellow fever situation is attributed to the greater attention being paid to sanitation.

Two years ago in the City of Mexico at the International Sanitary Convention of American Republics, Doctor Liceaga, the distinguished president of the Superior Board of Health, made the astonishing claim that they had eliminated yellow fever from the Republic of Mexico. It made somewhat of a sensation, and of course something akin to a small interrogation point arose in the minds of some of us, but we listened with respect, for we knew what they had done; and I want to say that since that date, and especially during the last summer, the results have really justified that statement. When you think that only a few years ago Vera Cruz was one of the worst infected ports on the western continent; that it was a constant menace to the United States; and that now, through the scientific and sanitary efforts of the Mexican government, inaugurated by Doctor Liceaga and backed up by President Diaz, it is free from that infection, I think you will all agree that the present status is a remarkable evidence of the intelligence and energy of our southern neighbors.

Not only did Doctor Liceaga say that he felt they had eliminated yellow fever from the Mexican Republic, but he said that the forces which they had been using to that end are now used against malaria, and that they expected to eliminate malaria from the Mexican Republic. Gentlemen, that is not only a work, an ambition and an expectation that is worthy of commendation, but it is something that should stimulate us. I believe they have given more attention to the destruction of the mosquito and the elimination of malaria and yellow fever than we have in this country, and we really can listen to them in this respect. The past year has been

one comparatively free from yellow fever in other countries as well, but it is due, I believe, to the increased attention that is being paid to sanitation all along the Spanish Main and the South and Central American Republics. Yellow fever is practically eliminated from Rio Janeiro. This is not a haphazard result, but is due to sanitary measures. Of course, we know about Cuba and the Canal Zone, and without doubt the honest and effective work in these two countries has had a marked effect by example. Then, too, the presence of medical officers of the Public Health Service, detailed in some eight or ten of the fruit ports in Central and South America, to make sure that the ships shall be free from infection before leaving, has had a sanitary influence on these republics.

Whether all who are here feel a special interest in the matter of yellow fever or not, it is a cause for congratulation that a disease which used to sweep over this country, and infected constantly all our neighbors, appears now to be practically wiped out. Of course, one swallow does not make a summer, and one or two summers of freedom from general infection is not enough to make us rest content, but still it is very encouraging, and it looks very much as though we had conquered in this western hemisphere the disease called yellow fever.

CHOLERA

Cholera being prevalent in Russia, an officer was detailed in the office of the United States Consul at Libau, which is the only port in Russia from which vessels carrying emigrants sail direct for the United States. Cholera was reported in Rotterdam August 26, 1909, and an officer on duty at Naples was sent to that port to assist the Consul in enforcing the treasury regulations. The outbreak, however, was of short duration, the disease being a recent importation from Russia, and terminated about September 11th, there having been thirteen cases and five deaths. In Manila there were 981 cases, and 23,094 cases in the provinces of the Philippine islands.

SMALLPOX

In the United States, 42 States, 1 territory and the District of Columbia reported 24,650 cases of smallpox, with 75 deaths, being 6543 cases and 6 deaths less than reported for the fiscal year 1908.

During the fiscal year 1902 there were reported 55,857 cases, with 1852 deaths. Since then the number of cases and deaths has gradually diminished.

VACCINE VIRUS AND ANTITOXINS

Twenty-one establishments were licensed by the Department, ten of them being foreign, under the act approved July 1, 1902. Investigations during the year demonstrated that foot and mouth disease may be transmitted to animals through vaccine virus. An outbreak of this disease was traced to the vaccine virus of two establishments. The license of one firm, which had expired, was not renewed, and the license of the other was suspended until all infected virus had been withdrawn from the market, and the infection eradicated. The infection was due to importation from abroad, and revised regulations were therefore issued which will effectually control the importation of this product, whether intended for sale or for laboratory purposes.

HYGIENIC LABORATORY

The additions to the building, provided by Congress, and trebling its capacity, were completed during the year. Nine bulletins, containing the results of scientific investigations were issued. The total personnel of the laboratory numbers sixty.

Besides the above, the laboratory has an Advisory Board, composed of representatives of the three medical services of the government, and the Bureau of Animal Industry, and five others, representing laboratories devoted to like research. These five members are: Professor William T. Sedgwick, of the Massachusetts Institute of Technology; Professor Victor C. Vaughn, of the University of Michigan; Professor Simon Flexner, of the Rockefeller Institute for Medical Research; Professor William H. Welch, of the Johns Hopkins University, and Professor Frank Wesbrook, of the University of Minnesota. Through this Advisory Board the Hygienic Laboratory is kept in touch with investigations in other laboratories, and has advice regarding investigation being made or to be made in the government institution.

RELATIONS TO THE PHARMACOPOEIA

In 1908 the board of trustees of the United States Pharmacopoeial Convention called upon the Bureau to undertake the publication of a series of bulletins embodying digests of comments on the pharmacopoeia. This work was begun in the Division of Pharmacology of the Hygienic Laboratory, and the first digest of comments was compiled and published during the fiscal year as Bulletin No. 49 of the Hygienic Laboratory. In beginning the work, it was decided to compile the material chronologically so as to present the available comments in proper sequence. The above mentioned bulletin, therefore, deals with literature of the latter half of 1905 representing the period from the publication of the Eighth decennial revision of the pharmacopoeia to December 31, 1905.

The comments contained in this bulletin are interesting and indicative of current opinions regarding the future of this work and the development of the Division of Pharmacology. In most foreign countries the pharmacopoeia is a government publication, and its preparation is purely a governmental function. For eighty-five years the pharmacopoeia of the United States has been by contrast a wholly private enterprise, compiled, developed and published by members of a voluntary organization, and attaining a legal status only gradually through the enactment of statutes by the several states which recognized its standards.

Through recent national legislation this publication has become the federal standard, and the significance and far-reaching effects of this change of status are shown by the fact that within a year some revision of the pharmacopoeia was made necessary. The problem now to be faced by the government and by the makers of the pharmacopoeia is, what shall be the attitude of each to the other with reference to what has been termed "a sanitary institution of the first rank."

It is gratifying that the work already done by the government has been welcomed and accepted as evidence that the relation of the Federal Government to the Pharmacopoeial Convention is to be that of co-operation without domination.

The first volume of digests already published has been accepted by those interested as an expression of governmental interest in a

volume of national consequence, and that such interest is second only to the legislative action making it the official standard in this country.

A second digest of comments on the pharmacopoeia has been prepared and submitted for publication as Bulletin 58 of the Hygienic Laboratory. This second bulletin covers the literature for the calendar year ended December 31, 1906. This period was one of unusual interest and activity in matters relating to the pharmacopoeia of the United States.

The enactment of the Food and Drug Act, June 30, 1906, and the signing, November 29, 1906, of an agreement by the United States and other powers for the unification of the pharmacopoeial formulas for potent drugs make the pharmacopoeia a legal standard for the development of which in part at least, the government has incurred treaty obligations.

Since the Pharmacopoeia of the United States and the National Formulary have become legal standards, the medicaments to be incorporated require careful study and the collection of disinterested information. This is necessary inasmuch as not only powerful financial interests but the maintenance of the public health are involved. In accordance with a resolution adopted by the American Pharmaceutical Association, the second digest of comments that has been prepared relates also to the National Formulary.

Besides the compiling and publication of a series of comments there is also a great deal of important work to be done in relation to the remedies to be incorporated in the pharmacopoeia, and the chairman of the Revision Committee has advocated the carrying on of such work in a government proving laboratory. The necessary test for the identity and purity of official remedies should be elaborated by workers who are free from the stress of commercial self-interest and competition, and such work can be carried on in the Hygienic Laboratory where the methods of making official preparations of official drugs and the standardizing of such preparations when so made should also be done.

Much work has been carried on in the Division of Pharmacology in relation to therapeutic remedies. In view of the coming Pharmaceutical Convention, the Chairman of Revision, requested

that some additional work be undertaken on the determination of melting points and boiling points in the pharmacopoeia. He pointed out that the melting point and boiling point of the various substances contained in the present pharmacopoeia had not all been determined by the same method, and that chemists and physicists were not united on the best and simplest means of determining these factors. He stated that there was necessity for uniform method of taking the melting point and boiling point, and requested that tests be made, and comparative tables be prepared for use in the next revision of the pharmacopoeia. It was decided, with the approval of the Secretary of the Treasury, to undertake this work, and investigations are now in progress with the view to the determination of the physical constants of pharmacopoeial substances, which include boiling point, melting point and solubilities.

The results of investigations into the relation of the iodine content to the physiologic activity of thyroid preparations, the physiological standardization of suprarenal preparations, and such drugs as digitalis, the toxicity of acetanilid mixture, and the standardization of antitetanic serum, which have been published, will be of value to members of the Pharmaceutical Convention.

Closely related to the work of the service in connection with the United States Pharmacopoeia is its co-operation with the American Medical Association in the work of the Council on Pharmacology and Chemistry, four of whose members are government officials, two of them in the Division of Pharmacology. In addition to the routine work carried on in connection with the Council with reference to the general question of new remedies, it has been shown in the Division of Pharmacology that digitalin, a preparation of world-wide use, under certain conditions becomes inert. There has also been demonstrated the variability of the extremely potent suprarenal preparations. Many unofficial drugs which have been used to a greater or lesser extent, some of them official at one time or another, are being studied with a view to determining whether they are of sufficient merit to justify therapeutic use.

SANITARY CONFERENCES AND ADVISORY BOARD

The Seventh Annual Conference of State and Territorial Health Officers with the Public Health and Marine-Hospital Service was held in Washington, June 2 and 3, 1909. Twenty-six States and

Territories and the District of Columbia were represented. The discussions illustrated the value of this official organization.

The Advisory Board of the Hygienic Laboratory was convened on March 26, 1909. Investigations conducted in the laboratory were discussed, and the advice of the board obtained with regard to the continuation of the same and new investigations.

The United States Government has been represented in the International Office of Hygiene at Paris by the detail of Surgeon H. D. Geddings. Dr. Geddings is stationed now at Naples, Italy, supervising the medical inspection of emigrants leaving that port, and signing bills of health. It is so arranged that when occasion demands he can attend the meetings and represent this government at the International Office of Hygiene in Paris. The service has also maintained its interest in the International Sanitary Bureau of the American Republics in Washington, and through a resolution passed by each body, this bureau was brought into relations with the Office of Hygiene in Paris.

The Twelfth International Congress on Alcoholism was held in London, July 18 to 24, 1909. The congress was well attended, there being about 1,400 members, and practically all civilized countries being officially represented. Among the speakers were members of Parliament, prominent lawyers, including the Lord Chief Justice, officers of the English navy and army, including the Surgeon-General, railway officials, teachers, clergymen and others.

Dr. Reid Hunt, chief of the division of pharmacology, in his report of the meeting states that it seemed to be the consensus of opinion that alcohol in any form is but seldom of distinct value in the treatment of disease, also that some evidence was brought forward to show that alcohol even in moderate amounts has an unfavorable effect upon subsequent offspring and a tendency to lower resistance to infection. The dangers of alcohol to those with any tendency to nervous or mental diseases was especially emphasized as were also the effects upon children.

Statistics were presented showing that there has been a marked decrease in the use of alcohol in hospitals. The statement was also made that the only pharmacopoeias which included whisky were those of the United States and Greece and it was suggested

that its recognition in this way gave it an undue prominence as a medicinal agent.

Another point brought out was the extraordinary growth of total abstinence in the British army and navy. Forty per cent. of the army in India are said to be total abstainers. The surgeon-general of the British army attributes this growth of total abstinence to the improvements that have been made in the housing and feeding of the soldiers.

The congress was held under the auspices of the British government. The next meeting will be at The Hague in 1911.

NATIONAL QUARANTINE

At the forty-four quarantine stations in the continental United States, 8,266 vessels were inspected, of which 520 were disinfected. Inspection has been maintained on the Mexican border.

National quarantine has been administered at seven ports in the Philippine Islands, seven in Hawaii, and eight in Porto Rico.

Medical officers have been stationed at eight fruit ports in Central America to enforce special regulations relating to fruit vessels to permit their entry into the United States without detention.

Details have also been made to ports in Cuba, Mexico, Barbadoes and St. Thomas, to Rio De Janeiro, Callao, Guayaquil, Naples, Calcutta, and to two ports in China and three in Japan. The officers have exercised quarantine supervision over vessels bound for the United States, and at a number of foreign ports have examined aliens by request of the immigration bureau and steamship companies. By request of the Venezuelan authorities, on account of the bubonic plague, an officer was detailed for duty at La Guaira; one also for immigration and quarantine service at Amoy, China, by request of the United States consul, with special reference to the protection of the Philippines.

In view of the establishment of a new line of steamers, plying from Salina Cruz and Manzanillo, on the Mexican-Pacific coast, direct to Honolulu, officers were appointed for the disinfection of vessels at the two Mexican ports named to prevent the introduction of yellow fever into the Hawaiian Islands, where this disease is at present unknown, but where the conditions are ripe for its spread should it be introduced.

MEDICAL INSPECTION OF IMMIGRANTS

During the fiscal year 966,124 immigrants were inspected under the immigration laws and regulations, and 14,536 were certified for rejection on account of physical and mental defects. The inspections were conducted at fifty-eight stations in the continental United States, Canada, Porto Rico and Hawaii, but do not include the examinations in the Philippines or at foreign ports. Personal examinations were made of 965 aliens reported as public charges in various institutions throughout the United States to ascertain whether they should be deported under the immigration laws.

Service officers have also, under the supervision of the Commissioner-General of Immigration, conducted the large hospital for immigrants at Ellis Island, where 6,186 patients were admitted for treatment.

SERVICE PUBLICATIONS

During the year 246,060 copies of the various publications edited in the bureau were distributed. These include the Annual Report, the Weekly Public Health Reports, the Bulletins of the Hygienic Laboratory, and various special bulletins relating to the public health. A new edition of the Bulletin entitled "Milk and Its Relation to the Public Health" has been published.

MARINE HOSPITALS AND RELIEF

In the twenty-one marine hospitals owned by the government, and at the 126 other stations where seamen of the merchant marine receive hospital and dispensary treatment, there were treated during the fiscal year 53,074 patients, of which number 14,209 were treated in hospital, and 38,865 at the dispensaries. The new marine hospital at Buffalo, N. Y., has been completed, and is occupied.

Physical examinations, exclusive of immigrants, were made of 4,980 persons connected with the revenue cutter, life-saving, steamboat inspection, immigration and light house services, the Coast and Geodetic Survey, Civil Service Commission, Isthmian Canal Commission, and Philippine service.

PERSONNEL

At the close of the fiscal year there were 128 commissioned medical officers, namely: The surgeon-general, five assistant surgeons-general, thirty-five surgeons, sixty-six passed assistant surgeons, and twenty-one assistant surgeons.

There were also 279 acting assistant surgeons,— a total of 407 medical officers.

There were also forty-five pharmacists.

Commissioned medical officers have served on special duty during the year as follows: Three have served with the Isthmian Canal Commission, respectively as director of hospitals, chief quarantine officer and in charge of the quarantine at Panama, and quarantine officer at Colon.

Two officers have been continued as chief quarantine officer and director of health, and as assistant director of health, of the Philippine Islands, respectively.

One officer, under the act of February 15, 1893, has been continued for duty at Guayaquil, Ecuador.

Fourteen officers are assigned to exclusive immigration duty for the physical and mental examination of aliens, their services being supplemented by employment of acting assistant surgeons.

Six officers are detailed to the quarantine service of the Philippine Islands.

Seven officers are detailed for service upon vessels of the revenue cutter service.

Twenty-three officers are detailed at the several quarantine stations in the continental United States, in Porto Rico, and the Hawaiian Islands.

One surgeon, four passed assistant surgeons, and one assistant surgeon, are assigned to duty in foreign countries to prevent the introduction into the United States of epidemic disease.

One commissioned officer detailed in the office of the United States consul at Guayaquil, Ecuador died of yellow fever while in the performance of his duty.

CONCLUSION

I have thus endeavored to give you an idea of the scope and character of the work of the Public Health and Marine Hospital

Service. My subject does not call for any comment upon the public health system or organizations of the United States, nor would there be time to discuss the same, but I wish to impress one thought upon you and that is that in the division of public health work in the United States,—national, State, municipal and county,—the relative importance of the work of the county health officers and the local physicians cannot be over-estimated. You gentlemen are the ones who are familiar with the local conditions which aid in the propagation of disease, and are the first ones to become acquainted with the existence of contagious or infectious diseases. You are, therefore, the first units in the nation's sanitary organization. The large attendance at this convention, the papers read, and the interest exhibited in the discussion, all give evidence of the vitality of your association. Your State Health Commissioner, Dr. Porter, attends the annual conference of the State boards with the Public Health and Marine Hospital Service, and through him and the secretary of your State Department of Health, Mr. Seymour, we have become acquainted with your energy and excellent organization; and in closing I have to wish you the greatest success in the work of your organization and in achieving your laudable aspirations.

CHAIRMAN D. S. BURE — We receive every week a bulletin giving the contagious diseases of every sort. It is a wonderful piece of work. From the early days it has grown and taken into account all kinds of contagious diseases, and it also gives the death rates. You of the towns may not know of this, but we of the cities know what is being done by the Public Health and Marine Hospital Service under the direction of Surgeon-General Wyman. I should like to record a vote of thanks to Surgeon-General Wyman for his very interesting and instructive paper.

DR. LESEUR — I move that the convention extend a vote of thanks to Surgeon-General Wyman of the Public Health and Marine Hospital Service of the United States, for his excellent paper showing the work done by that department in the past year.

THE CHAIRMAN — You have heard the question? Is there a second?
Motion seconded.

THE CHAIRMAN — Are you ready for the question? All in favor will say Aye, contrary No; it is unanimously carried, and the congress extends its thanks to you, Surgeon-General Wyman, for your paper.

SURGEON-GENERAL WYMAN — I thank you very much for this expression of your appreciation, gentlemen.

THE CHAIRMAN — An extra paper has been introduced this morning, a paper by the Inspector of the State Commission of Lunacy. It is by Dr. Russell on Care and Commitment of Insane Persons by Health Officers.

I have the pleasure of introducing Dr. William L. Russell, Medical Inspector for the State Commission of Lunacy of the State of New York.

CARE AND COMMITMENT OF INSANE PERSONS BY HEALTH OFFICERS

BY WILLIAM L. RUSSELL, M.D.

Medical Inspector for the State Commission in Lunacy

This subject is a very important one, but I promise not to take up much of your time.

A proposal to bring mental diseases within the field of work of the health officer may strike some as novel and possibly not altogether appropriate. The sphere of the health officer is, however, being steadily enlarged so as to embrace more and more of whatever relates to the public health. Why not, therefore, mental diseases? The conditions included under the general term "insanity" are now recognized to be of a character which must receive the attention of physicians, and the cases are regarded as proper subjects for medical care and treatment. These conditions resemble infectious diseases to the extent of requiring official action for the public good, and isolation of the cases. They are, too, in a great many instances, the outcome of avoidable causes, some of which are in the nature of infections. The prevalence of mental diseases in a community, or the public care and commitment of the cases is fundamentally not a question of poverty or of crime. It is a health question.

The medical view of insanity was not always so generally accepted as it is to-day, and the history of the care of the insane is a story of a long, hard struggle for its application in the practical methods of dealing with the cases. The struggle has been carried on by comparatively few physicians and philanthropists, arrayed against whom have been the forces of superstition, ignorance and selfishness, and the inertia of generally accepted views and customs. An epoch in the struggle in this State is marked by the passage of the State Care Act in 1890. This act provides that all poor and indigent insane persons in need of institutional care shall be cared for in State institutions, that private institutions for the insane shall be conducted only under State license, and that the execution of the laws relating to the care of the insane shall be under the direction of a State Commis-

sion in Lunacy. One of the most important features of the system of State care which has thus been established is the extent to which the medical view of insanity prevails in its organization and administration. The Commission in Lunacy is presided over by a physician, the superintendents of the State hospitals, and those in charge of the licensed private institutions are physicians. Nurses and sometimes physicians are sent to the various communities to bring the cases to the hospitals, and medical administration prevails throughout. More than 300 physicians are engaged in this work, about 200 of whom are employed by the State. The number of patients attended to annually is about 38,000. State care of the insane is the most extensive organized medical work that the State is engaged in, and as such is something in which the medical profession may feel a just pride and interest.

The State system is, however, organized almost entirely with reference to institutional care and to the larger State questions relating to insanity. The problem of dealing with mental disease in the community and of attending to questions relating to the commitment of individuals remains with the local authorities and is not attended to according to any uniform system nor always with regard to the medical view of insanity. Notwithstanding its important bearing on intelligent effective treatment of the cases, and on questions relating to prevention, this problem was evidently not fully worked out by the extremely able and far-seeing framers of the State Care Act. It should be remembered, however, that State care of the insane is of comparatively recent development in this country. Previous to 1850, only twenty State hospitals were in existence, and the care of the insane was, in most places, a purely local question. At that time large numbers of insane persons were confined in jails and lock-ups, in crude receptacles connected with almshouses, or, in various degrees of degradation and misery, were kept at home or allowed to roam at large. Eventually, in the more populous communities, the insane were segregated in special institutions connected with almshouses, or, in some instances, under separate medical management, and finally, in 1896, six years after the State Care Act was passed in this State, the State assumed the full responsibility. Under the earlier methods, the insane person in the com-

munity had been a subject for the constable and the poormaster, and the organizers of the system established under the State Care Act were unable to change this entirely. In 1891, the Commission in Lunacy recommended in its annual report to the Legislature that the statute be amended so as to provide for special local officers who should have preliminary charge of insane persons, and to take from the poor authorities the duties of determining the questions which relate to commitment. No change was, however, made. Briefly stated, the statutory duties of the poor authorities relating to the insane are, (1) to see "that all poor and indigent insane persons within their respective municipalities are timely granted the necessary relief conferred by" the statute, (2) to see that those who have sufficient means to support them are "properly and suitably cared for and maintained" by their relatives or guardians, or if not, that they are committed to institutions, and (3) to "take proper measures for the determination of the question of the insanity" of any person apparently insane, who may be arrested by a peace officer for "conducting himself in a manner which in a sane person would be disorderly." These duties relate practically entirely to care and treatment, to the determination of insanity, and to commitment.

The problems involved are as purely medical as the care and treatment of the insane in institutions, which by common consent the world over, have been intrusted to physicians. In the borough of Manhattan, the duties are attended to by the trustees of Bellevue and allied hospitals, and there and in Brooklyn the work has been fairly well organized under medical management. Elsewhere throughout the various towns and cities of the State the superintendents and overseers of the poor attend to it.

In Albany and in Rochester an effort has been made to provide for temporary hospital care for the cases previous to their commitment, and to have the work attended to under medical management. As a rule, however, the methods employed and the facilities provided differ little from those of twenty years ago when the distressing condition of so many insane persons cared for by the poor authorities led to the agitation which resulted in the adoption of State care.

The local poor authorities, I am sure, attend to their duties conscientiously and to the best of their ability. They are, however, laboring under the burden of the views and methods which prevailed so long under the old system, of lack of insight into the conditions from which the cases with which they are dealing suffer, and of the economy in expenditures incidental to their principal work, which is the relief of the poor. The medical needs of the cases are consequently frequently ignored, and in emergencies the only resource thought of apparently, for men and women alike, is the constable and the lock-up.

To those who see the cases after their admission to the institutions, the extent to which police methods have been employed in dealing with them in the communities seems quite unnecessary, and often extremely injurious. This question is discussed in two special reports issued by the Commission in Lunacy, which were the results of an investigation made by a committee which was appointed at a conference of representatives of the State hospitals with the Commission. These reports show that even in the borough of Manhattan, in New York city, where the work is in most respects managed well, 55 per cent. of the cases obtain hospital care only through police channels.

In the borough of Brooklyn in the same city, on the contrary, where nurses employed by the poor authorities are sent to the home for many of the cases, the possibility of eliminating the police to a great extent is clearly demonstrated. In the rest of the State it was found that nearly 20 per cent. of the cases received at the State hospitals were found by the nurses who were sent for them, in jails, lock-ups, and other places intended only for criminals. The conditions to which some of these cases had been subjected are described in the reports referred to, and cannot be justified except on the ground that they were the inevitable outcome of an inefficient system for which no remedy had yet been found.

The cases were, in most instances, brought to the State hospitals without much difficulty by one or at most two nurses, and their behavior after admission did not indicate that the severe measures employed were unavoidable. The investigation showed also that a considerable proportion of the cases received directly from homes had been subjected to gross neglect or ill-treatment, often for

long periods, sometimes years. Altogether, in the whole State, exclusive of Greater New York, about 35 per cent. of the cases admitted to the State hospitals in a year, or about 1,000 insane persons, had previous to their admission been confined in jails or lock-ups, or subjected to gross neglect or ill-treatment at home. Looked at with reference to disease and its proper treatment, a system that fails to protect such a large proportion of the cases from injurious experiences can hardly be considered free from defects.

With a view to remedying these defects it is proposed now to take a step toward placing mental diseases in the community on the same footing as other diseases which require official action, and to transfer from the poor authorities to the health officers the statutory duties which have been briefly outlined. These duties are practically of a medical character and will be better attended to by physicians. In New York City the work is already so well organized under hospital auspices that no change is contemplated there.

In other parts of the State the health officers are the only medical officials available, and to utilize them seems more feasible than to attempt to establish a new position as was recommended by the Commission in Lunacy in 1891. In Rochester, and possibly in other cities where the health bureau attends to the needs of the sick poor, the health officers already frequently look after insane cases. If the duties and responsibilities relating to the care and commitment of insane persons are transferred to the health officers, it will, I believe, assist in establishing in the minds of the people in general that the cases are suffering from illnesses which require the attention of physicians and nurses, and which are likely to be aggravated by the methods of the constable and the poormaster.

The tendency of the friends of an insane person is to look to physicians for aid rather than to the poor authorities. Recently in one of the large cities a number of citizens appealed to the health department on account of the presence of several insane persons in a house in the neighborhood, and the health officer took the matter up and dealt with it as he would have with any other health question. In another city a letter was received by the board of

managers of the State hospital located there, from the local health officer, who asked their co-operation to secure better facilities for the temporary care of insane persons in the city. The health officer would, when consulted, be more likely than the overseer of the poor to appreciate the nature of the case and to act promptly. This would doubtless result in earlier treatment, and conditions which lead now to severe measures in some instances would often be anticipated. Advantage would probably be more frequently taken of the provisions made by statute for admission to the State hospitals by means of the emergency commitment and by voluntary application. Consultations with the hospital physicians and the employment of State hospital nurses when necessary could no doubt be arranged for under proper conditions. I can promise for the department that an earnest effort to be helpful would be made.

Better co-operation between State and local authorities with special reference to the medical needs of the cases would do much to overcome the present difficulties. Local hospital provision is also essential. This would no doubt be more keenly realized by medical officials than it is by the poor authorities, and a strong effort would likely be made to obtain it. In this the aid of the local medical profession could be counted on. A splendid example of what can be accomplished was shown in Albany when ten years ago, according to Dr. Mosher, seven physicians succeeded in securing from the county board of supervisors the establishment of the psychopathic ward at the Albany Hospital. The Commission in Lunacy could also be confidently expected to aid in any way in its power, and it may be possible to obtain legislation that will enable the Commission to be even more helpful than it can be at present. Better hospital provision for mental cases in the communities is much needed, not only for the better care of cases whose commitment to the State hospitals is contemplated, but also for the better treatment of the psychoneuroses, of intoxications, of infection deliria, and of other conditions out of which insanity may develop.

The problem of insanity is by no means solved by the segregation of the cases in large State institutions. A more widespread intelligent interest is needed. Those who deal with the cases in the earlier stages need to have a better insight into the nature of

their disorders and into the conditions from which they arise than is at present the case. This would be a step toward more efficient treatment and cure, and should eventually assist in increasing activity and interest in prevention measures. Not less than 40 per cent. of the male admissions to the institutions for the insane are due directly to alcohol, drugs, syphilis, and the acute infectious diseases, and the better understanding of the nature of the conditions from which the cases suffer, which has been made possible by the advance in clinical psychiatry, is opening up the way toward prevention measures more and more clearly. State care has already done much for clinical psychiatry. The proposed plan for extending the application of the medical view of insanity to the official methods of dealing with insane persons in the communities is in a measure an extension of State care.

The health officers are to some extent State officials. They are also more or less organized under the leadership of the State Commissioner of Health. The foundation is thus provided for building up on a medical basis, under State auspices, a system of dealing with the whole problem of mental diseases, in a more efficient way than has ever been undertaken before. An opportunity for an extremely useful and promising field of work is offered to the health officers.

A bill has been prepared to provide for the legislation needed. In this bill ample provision has been made for compensating the health officers for the extra work and responsibility required of them, and the wish of those interested in the bill is to act in harmony with the State Commissioner of Health in safeguarding the interests of all concerned and of the other important work which the health officers are engaged in.

THE CHAIRMAN—The next paper on the program will appeal to all of us directly. It is "The Investigation of a Typhoid Epidemic," and is presented by Passed Assistant Surgeon L. L. Lumsden of the United States Public Health and Marine Hospital Service.

THE INVESTIGATION OF A TYPHOID EPIDEMIC

BY L. L. LUMSDEN

Passed Assistant Surgeon, U. S. Public Health and Marine Hospital Service

It was with great pleasure that I accepted an invitation to present before this Conference of Sanitary Officers of New York State a paper on the subject of "The Investigation of a Typhoid Epidemic." I am keenly appreciative of the honor bestowed upon me by such an invitation, and if I bring no new thought pertaining to the epidemiology of typhoid fever, I trust that it may be of interest to some of you to hear of the typhoid situation in Washington, D. C., and the methods followed in the investigation of it by the Typhoid Fever Board of the United States Public Health and Marine Hospital Service.

IMPORTANCE OF THE TYPHOID FEVER PROBLEM IN THE UNITED STATES

Of the problems in sanitation confronting us in America to-day, the prevention of typhoid fever stands out clearly as one of the most important. The measures required to prevent the spread of this communicable disease are known, but the practical difficulties encountered in getting these known measures carried out constitute the real problem.

The widespread and continued high rate of prevalence in our country as a whole of this thoroughly preventable disease is beginning to be justly considered a national disgrace. According to the Census Report for 1900, the average typhoid death rate for the United States was 46.5 per 100,000 inhabitants. This means that in the census year, which may be taken as an average, there were about 500 cases of typhoid fever with over forty-six deaths, among every 100,000 persons composing the American nation. The total number of deaths from typhoid fever recorded in the census year 1900 was 35,379, which gave typhoid fever fourth place on the mortality list.

The American nation justly boasts of its great wealth, its wonderful natural resources, and its leadership in adventure and invention; but when we compare our typhoid fever statistics with

those of other countries, we have cause for grave contemplation. Thus the typhoid fever death rate per 100,000 inhabitants for the years 1901-1905 was in Scotland, 6.2; in Germany, 7.6; in England and Wales 11.2; in Belgium, 16.8; in Austria (1901-1904), 19.9; in Hungary, 28.3; in Italy, 35.2; while the rate in the United States during this same period was about 46 (estimated). Some of these European countries now having relatively low rates, formerly had high ones. In Prussia the typhoid death rate has been reduced in the last twenty-five years from over sixty to less than twenty per 100,000 inhabitants. The climatic conditions in some of these countries seem to be as favorable to typhoid infection as those of the United States as a whole. Therefore it appears reasonable to conclude that their decidedly lower typhoid rate is due to their better enforcement of the measures needed to prevent typhoid fever.

In the United States typhoid fever is especially prevalent in the South. According to the Census Report for 1900, the ten States which had the highest typhoid death rates (average about seventy-nine per 100,000) are all States located south of the Potomac river and east of the Mississippi river. The twenty-two States which had the lowest rates (average about twenty-four per 100,000) are all northern or western States. Some of the northern States now having relatively low rates formerly had high rates, as high or higher than those which some of the worst affected southern States have had in recent years. Massachusetts in the decade 1871-1880 had an average annual typhoid death rate of sixty-two per 100,000, while in the period 1901-1905, it was 18.2. The lowered typhoid death rates in the northern States have followed improvements in the water and milk supplies, the installation of better sewerage systems, and improvements in the general sanitary conditions.

Several factors no doubt contribute to the relatively high rate of prevalence of typhoid fever in the South, among which probably the chief are:

1. Faulty sewage disposal, incident to the relatively large rural population, and particularly, as pointed out by the investigations of Stiles,* to the relatively large percentage of negroes in the population.

* Hookworm Disease and the Negroes; Hampton Leaflets, September, 1909.

2. Climate; the long periods of warm weather, when there are additional agents for the transmission of the infection, such as flies and other insects, greater quantities of uncooked foods and drinks are consumed, and there is probably greater individual susceptibility to the infection.

Considering the number of communities in the South in which polluted water supplies have been used for long periods, it is a notable fact that there have been reported in the South no pronounced and extensive epidemics of typhoid fever caused by water-borne infection. It may be that the causative organisms in the relatively warmer river and lake waters of the South do not survive in sufficient numbers to cause pronounced epidemics. In some communities in the South, as has been shown for some in the North, water may play an important part; but judging by the limited data obtainable, it seems probable that water is a relatively less important factor in the spread of the infection in the South than it is in the North.

Not many years ago typhoid fever was regarded quite generally as being almost, if not quite, wholly a water-borne disease, and the purity of the water supply of a community was estimated from the typhoid death rate. By careful epidemiologic studies of the subject it has been learned that in some communities there may be a high typhoid death rate due largely, or even entirely, to factors other than water in the spread of the infection, and sanitarians now regard the typhoid rate of a given community as a fair measure of the sanitary intelligence exercised by that community, not only in regard to the water supply, but in regard to all other factors possibly concerned in the transmission of typhoid infection.

NATURE AND SOURCE OF THE INFECTION

In recent years the generally accepted view has been that typhoid fever is an infectious disease caused by a specific micro-organism, the typhoid bacillus. The elements of mystery remaining concern the establishment of individual susceptibility to the infection, and, in some instances, the mode of transmission of the infection. We have no idea why, in some instances, fifty or more persons will be apparently equally exposed to the infection and only one or two will have the disease. We may indulge in interesting specu-

lation as to the chances of typhoid bacilli surviving, multiplying, and causing infection when ingested by a number of persons and subjected to the very different conditions (bacterial life, etc.) existing in different alimentary canals. Pending whatever discoveries may be made in the future in regard both to susceptibility and to any as yet unknown agents there may be in the transmission of the infection, we should employ, in efforts to prevent the disease, the instruments which we have at hand and which have proved effective.

All the accumulated evidence supports the view that man is the permanent host of the parasitic organisms which cause typhoid fever, and if their multiplication in and their dissemination by the human host could be prevented these organisms would soon perish. An apparently sound belief based on epidemiological findings is that "Each and every case of typhoid fever comes somehow from some previous case." This would seem to give us the cue for preventive measures,—to destroy the infection as it leaves the bodies of infectious persons. To the inexperienced this may seem a simple formula and one easy to apply, but the practical sanitarian knows that many difficulties beset its application. The people in a given community may use water, milk and various foodstuffs obtained from a distance, and liable to contamination with the excreta of infectious persons over whom their own health officials have no jurisdiction. Many cases are not recognized or not reported until there have been many chances for the infection to have spread from them. Therefore, for the local health officer the two principal plans of action to prevent typhoid fever in his community should be the following:

1. The prevention of the spread of infection from persons in his community who harbor infection (typhoid fever patients and bacillus carriers);

2. The prevention of the introduction of infection into his community from without, through various channels, such as the water supply, the milk supply, and the general food supply.

In order to carry out a successful campaign against typhoid fever in a locality, the principal immediate sources of the infection must be known, and in order to determine these, careful epidemiologic studies are necessary.

DIFFERENT TYPES OF TYPHOID FEVER SITUATIONS PRESENTED FOR STUDY

Explosive outbreaks, such as those produced by highly infected water or milk, occurring in communities previously comparatively free from the disease, present rather characteristic features, and as a rule epidemiologic studies of these will point out quite readily and definitely the source of the infection. But in communities where a high rate of prevalence of typhoid fever is maintained for years and is due to a number of different factors which vary in relative extent of operation from time to time, the problem becomes very intricate and its exact solution exceedingly difficult. Most of the larger American cities present such complex typhoid fever situations. In the large urban community the conditions of life are complex. Large numbers of all classes of people are in close association. Foodstuffs are obtained from many sources and handled by many persons. The milk supply especially comes from many sources. In some instances the water supply is obtained from a number of different sources.

In the United States the rate of prevalence of typhoid fever is higher in the rural sections than in the cities. Other things being equal, a city surrounded by and obtaining its food supplies from a section of the country in which the typhoid rate is high will have a higher typhoid rate than a city surrounded by and obtaining its food supplies from a section of the country in which the typhoid rate is low.

The explosive and pronounced outbreaks of typhoid fever have had tremendous educative value, yet the number of cases occurring in such outbreaks composes but a small part of the whole number of cases occurring in the country every year. For the majority the infection spreads insidiously from house to house, from community to community,—hands, water, milk, various foodstuffs, flies, etc., serving as agents of transmission; the primary source of infection, however, being always the carelessly disposed of dejecta from some person.

METHOD OF INVESTIGATING A TYPHOID SITUATION

Studies of all typhoid situations should be conducted along the same general lines. *Hasty* conclusions, based on first glance im-

pressions, should be avoided. Every factor possibly concerned in the spread of the infection should be carefully considered and investigated. As the facts are collected, one possible factor after another may be eliminated until definite conclusions may be drawn as to the principal source or sources of the infection.

During the past three years, as a member of a board of officers* detailed by the Surgeon-General of the Public Health and Marine Hospital Service to study the origin and prevalence of typhoid fever in the District of Columbia, I have been engaged in the study of a typhoid situation of the complex urban type.

I shall now endeavor to outline briefly some of the features of the typhoid fever problem in Washington, our methods of studying this problem, and some of our findings.

THE TYPHOID SITUATION IN WASHINGTON, D.C.

The high rate of prevalence of typhoid fever in the District of Columbia has long been a matter of concern to the inhabitants. Before the improvement of the public water supply in 1905, there was quite a general consensus of opinion among those who had given attention to the subject, that Washington's high typhoid rate was due to the polluted water supply obtained from the Potomac river. From time to time engineering projects to improve the quality of the water, such as the construction of subsiding basins, were recommended and carried out. Such sedimentation of the water as was accomplished, however, did not succeed in sufficiently clarifying the water, or in satisfactorily reducing the typhoid rate. Congress, therefore, acting on the advice of a number of the country's most expert sanitary engineers and sanitarians, provided for a further improvement of the water supply by means of slow sand filtration, appropriating for this purpose the sum of \$3,468,405. The filters were constructed under the supervision of officers of the Engineering Corps of the United States Army, and were completed in October, 1905. Since then the city has been supplied continuously with filtered water.

During the winter and spring months following the installation of the sand filters there was comparatively little typhoid fever in

* Surgeon M. J. Rosenau, Chairman; Passed Assistant Surgeon L. L. Lumsden; and Prof. Joseph H. Kastle, Recorder.

Washington, but early in July, 1906, there occurred a great increase in the number of cases, and the disease was properly regarded as prevailing in epidemic form. This marked increase in the prevalence of typhoid fever with the advent of summer weather corresponded with the history of the disease in many previous years. The recurrence of the disease at the usual rate, or even in excess of the usual rate, despite the improvement in the water supply, was a keen disappointment both to the medical profession and to the general public, as it had been expected and assurances had been given that sand filtration would greatly diminish the disease in Washington, as it had done in other cities. The health officer of the District found himself confronted with an unusual and difficult situation, and at his instance the Commissioners of the District of Columbia requested the Surgeon-General of the United States Public Health and Marine Hospital Service to cooperate with the health officer in making a study of the subject. In accordance with this request, the Surgeon-General detailed a board of officers to convene on July 2, 1906, for the purpose of making a thorough investigation of the typhoid fever situation in the District of Columbia.

We have now been engaged in the study of this problem for over three years. The results of our studies in 1906 and 1907 are published in Hygienic Laboratory Bulletins Nos. 35 and 44 respectively, and the results of our studies in 1908 are now in press and will be issued in a few days.

In conducting this investigation we have considered and studied every factor which we have thought could possibly have to do with the transmission of the infection of typhoid fever. The investigation has included a sanitary survey of the Potomac watershed; chemical and bacteriologic examinations of hundreds of samples of the city's water supply; a special study of the pumps, wells and springs in the District, and of bottled waters sold in Washington; inspection of the dairies, and laboratory examinations of the milk supply; inspections of the ice factories, and chemical and bacteriologic examinations of samples of the ice and of the water from which the ice was made; the making of cultures, widal tests, etc., to aid in the diagnosis of cases; examinations in the Division of Zoology of the Hygienic Laboratory of two hundred specimens of

feces from typhoid patients to determine the relation of animal parasites to susceptibility to typhoid infection; a house-to-house canvass of thirty-two city blocks, having a population of over 5,000, with a view of determining what proportion of typhoid fever in Washington is unrecognized or not reported, and also to collect data as to the sanitary condition of residences and as to the water and food supply of the general population. In making this intensive study of certain city blocks, over a thousand specimens of feces from persons in health or with illnesses not suspected to be typhoid fever were collected and examined for the presence of the typhoid bacillus. This was done with the view of determining what proportion of the population harbors and perhaps disseminates the infection without having the disease in clinically recognizable form. The bathing beach and public markets have been inspected from time to time, and the question of shellfish, fruits and vegetables in relation to the disease has been given attention. A study of house-flies as possible carriers of infection has been made and their seasonable abundance considered in connection with the seasonal prevalence of typhoid fever. An exhaustive epidemiologic study has been made of the cases reported to the health office during periods of the four years as follows: July 1 to November 1, 1906, 866 cases; May 1 to November 1, 1907, 675 cases; May 1 to November 1, 1908, 679 cases; January 1 to November 1, 1909, 670 cases; making a grand total of over 2,800 cases. The collection of the data regarding the individual cases has been done each year by the same officer (Lumsden), so that differences in findings between any two of the years we believe may be attributed to differences in the conditions, the factors of personal equation not having varied.

The data in regard to each case are obtained by a visit to the residence of the patient, and a sanitary inspection of the premises. The patient himself, or when his condition does not permit of it, some other member of the household familiar with the patient's habits, is interviewed in regard to food and drink used, direct or indirect contact with previous cases, and all other facts which can be ascertained which may throw some light on just how the infection was contracted by that individual case. In conducting such an inquiry it is necessary to exercise great care and patience and

to avoid as much as possible the asking of leading questions; otherwise erroneous and, therefore, misleading statements may be obtained.

In this study of the cases the following blank forms have been used.

A

Typhoid case card used in 1906. All facts called for by this card were carefully investigated for each case.

United States Public Health and Marine-Hospital Service—Hygienic Laboratory

TYPHOID FEVER—CASE CARD

Name, Date of investigation, Case No.
Age, Male or female, White or colored, Married or single, Probable date onset of disease, Date definite symptoms, Name and address of physician,

RESIDENCE

Residence when taken sick,; from to
Previous residences,; from to
Subsequent residence,; from to
Residence when infection was contracted, Number of occupants, ...
Servants,
 White—
 Resident,
 Nonresident,
 Colored—
 Resident,
 Nonresident,
Connected with city water system?
Connected with city sewerage system?
Privy? Location,
Privy vs. well,
Water-closets in house? Water-closets in yard?
Screens? Flies? Mosquitoes? Ants? Roaches?
Bedbugs? Rats? Mice? Other vermin?
General sanitary condition,

OCCUPATION

.....
Place,; from to
Drinking water, Sewage, Other cases, Flies, etc.,

WATER

Kind used thirty days prior to onset of illness:
 Boiled, Filtered, Bottled, kind, Soda water,; where,
 Source, In or for drinking,
Ice:

FOOD

Where taken thirty days prior,
Milk, thirty days prior,; from Boiled, Pasteurized,
Ice cream,
Milk used since illness; from Bottles,
Uncooked fruits and vegetables, thirty days prior,; from
Oysters, Clams, Crabs, Lobsters, Other shellfish,
....., Fresh-water fish (Potomac),

CONTACT

Cases in house (six months prior), Cases in house near by (six months prior), Association with infection,

MISCELLANEOUS

Domestic animals on premises: Dogs, Cats, Cows, Horses, Guinea pigs, Birds, Other animals,
 Disposal of feces and urine,
 Other means to prevent spread of infection:

SUMMARY

Remarks:

(Signature of investigator.)

B

Typhoid case card used in 1907, 1908, and 1909. All facts called for by this card were carefully investigated for each case.

Public Health and Marine-Hospital Service — Hygienic Laboratory

TYPHOID FEVER CASE CARD

Date of investigation, Case No.
 Name,
 Age, Color, Sex, Nationality,
 Probable date of onset, Date definite symptoms,
 Name and address of physician:

RESIDENCE

Resident of District of Columbia, years, months.
 Residence when taken sick,; from to
 Previous residences,; from to
 Subsequent residence,; from to
 Temporary absences from District of Columbia within 30 days prior
 Number of occupants, Ages,
 Number of occupants who have had typhoid, When,
 Newcomers in house within three months prior,
 Newcomers in house had typhoid?
 Servants,
 White —
 Resident, Typhoid?
 Nonresident, Typhoid?
 Colored —
 Resident, Typhoid?
 Nonresident, Typhoid?
 Typhoid at homes of servants, When?
 Disposal of sewage, Water-closets in house?
 Water-closets in yard? Privy? Location,
 General sanitary condition of residence,

OCCUPATION

Place,; from to
 Other cases:

WATER WITHIN THIRTY DAYS PRIOR

..... solely; principally.
 occasionally.

FOOD WITHIN THIRTY DAYS

Where taken,
 Milk (how used),; from
 Boiled? Pasteurized?
 Ice cream? Where?
 Uncooked fruits and vegetables,
 Shellfish,

CONTACT

Association 30 days prior with patients in febrile stage,
 Association with suspected cases,
 Association with persons who have had typhoid within 6 months,;
 1 year,; 2 years,; 3 years,; 4 years,; 5 years,

 Association 30 days prior with persons in contact with patients in febrile
 stage,
 Treatment of stools and urine of patient,
 Other precautions,
 Remarks:
 Summary:

.....
 (Signature of investigator)

In some instances several visits to a home are necessary before all of the data for a given case can be obtained.

As the work progresses, the case-cards are frequently reviewed, so that if any possibly responsible factor is common to a group of cases, the fact may be discovered early and the possible exposure of subsequent cases to the same factor looked out for. By this means an outbreak due to infection in milk supplied by some particular dairyman may be recognized, or at least strongly suspected, frequently at its very beginning.

The cases are charted on a street map of the city, pins, each with the number of the case attached, being stuck in to indicate the places of residence of the cases when the infection was presumably contracted. By means of this map the geographical distribution of the disease can be followed and the grouping and sometimes the relation of cases to one another discovered.

If in the course of the investigation of a case the facts suggest the possibility of some member of the household being a bacillus carrier, effort is made to obtain specimens of feces and urine from such person, for bacteriologic examination. If we find that other members of the household have had typhoid previous to the case under investigation, we usually endeavor to obtain specimens.

We have had one house outbreak apparently due to infection from a bacillus carrier. The family consisted of a mother, a son and three daughters. The son had typhoid in October, 1908. Subsequent to his attack, the three daughters developed typhoid as follows; one in December, 1908, one in January, 1909, and one in February, 1909. Specimens of feces and urine were obtained from the mother and from the son. The son's urine was found to

be teeming with typhoid bacilli, the number being apparently about equal to that of a 24-hour broth culture of the organism. Treatment with urotropin was begun, and within four weeks the urine became free from typhoid bacilli. This man had recovered from his attack of typhoid about three months previous to the examination of his urine, and in the meantime had been employed as a laborer with a large number of other men at the Washington Navy Yard. Had his condition not been discovered and treatment given he might have continued to spread infection for many months or even years. Prompted by the discovery of this carrier, and the general interest that has been given in the last few years to the subject of bacillus carriers, we have had collected and have made bacteriologic examinations of specimens of feces and urine from over 300 persons who have had typhoid fever within the past ten years. This study has been made with the view of determining what proportion of persons in Washington, recovered from typhoid fever, are bacillus carriers, and the findings will be published in our report for 1909.

We have endeavored to make the investigation in Washington as thorough and comprehensive as possible. Our object has been to continue to collect facts until we have sufficient to warrant definite conclusions. We believe that only by such prolonged and painstaking study can the intricate problem of urban typhoid be satisfactorily solved.

As the results of our studies for the three years are set forth in the publications, I shall refer to them but briefly, limiting the reference mainly to the three factors usually most concerned in the transmission of typhoid fever infection, viz., water, milk and personal contact.

Water.—The typhoid fever case rate and death rate in the District of Columbia were lower in 1907 and 1908 than in any other year of which there is record. The death rate per 100,000 of population in 1906 was 49.3, in 1907, 34.5, and in 1908, 36.5. These represent the death rates for the first three years after the filtration of the public water supply was begun. The average annual typhoid death rate for the three years immediately before the filtration of the water was about 44 per 100,000, and for the three years 1900, 1901 and 1902, about 68 per 100,000. The reduc-

tion of the rate in 1907 and 1908 is accounted for by the reduction in the summer typhoid. The rates in the fall, winter and spring seasons of the three years 1906, 1907 and 1908 were almost exactly the same. An important question and one difficult to answer positively is, "How much of the reduction in the typhoid fever rate for the summers of 1907 and 1908 was due to the improvement in the water supply, as the result of sand filtration?" Had such a reduced rate been observed in the summer of 1906, the first summer after the filters were put into operation, there would probably have been few, if any, who would have doubted that the reduction in the summer typhoid had been accomplished by the improvement in the water supply. In 1906, however, the rate equaled, or even exceeded, the rates of the several years previous, despite the fact that the results of the bacteriologic analyses of the water showed that the filtration effected a very great reduction in the bacterial content of the applied water, such as was supplied the city during the three years prior to filtration. Judged by bacteriologic standards, we found the filtered water supplied the city during the typhoid seasons of 1907 and 1908 was of considerably better quality than the filtered water supplied the city in the season of 1906. The fact that the lower typhoid rate in the summers of 1907 and 1908 followed the higher degree of improvement in the filtered water seems to suggest cause and effect.

As a board, we have not been able to decide definitely as to what part water-borne infection played in the causation of typhoid fever in 1906, but we are satisfied from the results of our studies, that the Potomac river water previous to filtration caused much less of Washington's typhoid than was generally supposed, and that in the typhoid seasons of 1907 and 1908 the filtered public water supply played a relatively minor role, if any, in the causation of the disease.

Milk.—In the typhoid season (May 1 to November 1) of each of the three years 1906, 1907 and 1908, we have definitely attributed about 10 per cent. of the cases originating in the District of Columbia, to milk-borne infection. These cases occurred in the course of pronounced outbreaks among the customers of certain milk dealers. In the season of 1906, there were three such out-

breaks, in the season of 1907 one, and in the season of 1908 one. The outbreak in the fall of 1908* was of particular interest, inasmuch as the infection was traced to a bacillus carrier who was engaged in handling the milk on one of the farms from which the implicated supply was obtained. This woman gave a history of having had typhoid fever eighteen years before and of having been since then in robust health.

Besides the cases which have occurred in the course of pronounced milk outbreaks, we believe that there have been a number of scattering cases due to infected milk which we have not been able to trace, and we consider milk one of the major factors concerned in the transmission of typhoid infection in Washington.

Contact.—Of the cases originating in the District of Columbia in the typhoid seasons of 1907 and 1908, about 20 per cent. gave a history of more or less direct or indirect association during the thirty days prior to onset of illness, with previous cases of typhoid fever in the febrile stage of the disease, and were attributed to infection by contact. Considering the amount of association between persons living in a large city and the number of ways in which infection through personal contact may occur, it is easy to understand that many cases of typhoid fever in a large city may be due to infection by contact which cannot be traced.

We regard contact as one of the major factors now concerned in the transmission of typhoid infection in the District of Columbia.

Imported Cases.—About 24 per cent. of the cases of typhoid fever which were reported in the District of Columbia during the typhoid seasons of 1907 and 1908 were cases in which the infection had been contracted out of the District of Columbia. In the 1906 period, the imported cases amounted to about 15 per cent. of the total.

A number of interesting details as to seasonal prevalence, geographical distribution, racial prevalence, etc., have been worked out, but they are contained in the published reports† and enough

* Lumsden, L. L., and Woodward, Wm. C.; A milk-borne outbreak of typhoid fever traced to a bacillus carrier; Journ. Amer. Med. Assn., March 6, 1909, vol. 52, pp. 749-752.

† Rosenau, M. J., Lumsden, L. L., and Kastle, J. H.; The origin and prevalence of typhoid fever in the District of Columbia; Report No. 1, Hygienic Laboratory Bulletin No. 35, Washington, D. C., 1907 (season of 1906); Report No. 2, Hyg. Lab. Bull. No. 44 (season of 1907); Report No. 3, Hyg. Lab. Bull. No. 52 (season of 1906).

has been cited to give some idea of the intricacy of the typhoid fever problem in Washington.

There is no mystery as to why Washington has some typhoid fever, but in view of the general sanitary conditions, an annual typhoid death rate of 35 per 100,000 does seem comparatively high, provided that none of the infection is water-borne.

In considering Washington's typhoid rate it should be borne in mind that Washington is climatically a southern city, surrounded by and obtaining its food supplies from a rural section in which typhoid fever is highly prevalent. I know of no city of over 75,000 inhabitants, south of Washington and east of the Mississippi river, which during the two years 1907 and 1908 had a typhoid death rate as low as that of Washington.

In attempting to draw conclusions from the data which we have collected in Washington we have realized the need of comparable data from other cities. Unfortunately such comparable data as are now available are too meagre to be of much value.

Investigations similar to the one we are conducting in Washington, if carried out simultaneously in a number of the larger American cities, would throw much light on the great problem of urban typhoid, both locally and generally.

By some it may be considered unfortunate that the typhoid problem in Washington has proved to be of such complexity that after three years of study we have not been able to solve it with mathematical exactness,—in other words, to point out definitely the immediate source of infection for every case; but by those taking a broader view of the subject, I believe it must be considered fortunate, because for investigators of similarly complex typhoid situations, our methods may serve as a guide and our failures prevent discouragement. In the simpler typhoid situations, such as the explosive outbreaks due to highly infected water or milk, and the typhoid in small towns and in rural sections, these epidemiologic methods should almost invariably yield satisfactorily definite results.

In conclusion I would urge every local health officer to apply himself with might and main to the typhoid fever problem in his community. Of the widely prevalent infectious diseases none promises better results from equivalent amounts of intelligent

effort at prevention than does typhoid fever. Considering the tremendous tax in lives and resources which the American nation pays annually to typhoid fever, the time certainly seems ripe for our health officials,—city, county, State and national,—to begin a general and concerted plan of action against this “pestilence that walketh in darkness.”

DR. H. H. CRUM — *Mr. Chairman, Ladies and Gentlemen:* I will simply add a concrete instance of the importance of milk.

On the 9th day of August of this year I discovered a case of typhoid in the home of a milk dealer named Quick. The case was removed at once to the City Hospital. The house was cleaned; the drains and closets were cleaned, and Mr. Quick did everything I asked him to do and did it under my direction.

The patient, a daughter-in-law of Mr. Quick, had been away from home—in Binghamton and other places, and I was led to believe at first that she might have contracted the disease in some of these places.

But, August 16th typhoid began to be reported and in two or three days more than a dozen cases were reported. All these cases were in one small locality, and I found that all used milk purchased from Mr. Quick. I visited Mr. Quick and got his milk route in detail and I found that less than one-half of his route was affected. I found that the first part of his route was free absolutely. On this part of his route he sold exclusively milk produced by himself. I then found that the milk sold on the part of the route infected was purchased by Mr. Quick from three farmers in Ellis Hollow, east of the city. I sent my milk inspector to investigate and he reported that one of these farmers, Mr. Middaugh, had been ill a week and that the disease had just been diagnosed as typhoid. The same day the case was reported to me as typhoid by the attending physician.

My inspector also reported that another of these farmers in Ellis Hollow, a Mr. Wilsey, had been ill a number of weeks but that he had had “sunstroke.”

Now, take notice that twelve days had not elapsed since I found the first case, Mr. Quick’s daughter-in-law.

I stopped the milk coming from Ellis Hollow. I went out and found that my inspector was correct in his findings. I also found that Mr. Wilsey, our friend with the “sunstroke” had had a little intestinal fever following his stroke; that he had had nasal hemorrhage and hemorrhage from the bowels; as Mr. Wilsey expressed it: “The doctor almost physicked me to death.”

I was now confident that our trouble was due to milk from Ellis Hollow. I might state that I found that Mr. Wilsey’s mother was Mr. Middaugh’s wife and that Mrs. Middaugh had helped care for her son, Mr. Wilsey, when he had the “sunstroke.”

Time passed; by August 31, thirty-five cases of typhoid had been reported and every one was in the same locality and had taken milk from Mr. Quick. And still no cases developed on the first part of Mr. Quick’s route. We continued to get cases of typhoid from this half milk route all through the month of September, and the total of cases due to this infection was over seventy-five.

Now you will ask: How did Mr. Quick’s daughter-in-law contract the trouble? I will tell you. He sold all of the milk of his own production first. Then he purchased the Ellis Hollow milk; finished his route; and, if he had any milk left he carried it home and used it in his own family.

A little later in October a rumor reached me that a Mr. Place, six miles south of Ithaca, might have typhoid. As my records show that he was a producer of milk for our market, I communicated with his physician, and on October 18 I received the following reply:

“DEAR DOCTOR.—Replying to yours of recent date, I would state that the patient referred to, Mr. Claude Place, has typhoid fever.

“He undoubtedly contracted it by drinking from the same cup as Royal Johnson without turning out the water left in the cup by Johnson.

"Johnson runs a threshing rig and became sick about two weeks after threshing and boarding at Glenn Wilsey's. He had an atypical, light case of the disease which was incorrectly diagnosed by four doctors, myself included. He ran his threshing rig throughout the whole course of his sickness and at the last infected his wife and daughter, who are now sick of typhoid fever. His blood gives a positive Widal reaction.

"Mr. Place's milk was promptly withdrawn from the Ithaca market and his cows have been taken over by a neighbor who works the herd and sends the milk to the Slaterville creamery.

"Assuring you of my own and Mr. Place's hearty co-operation in any reasonable sanitary measures, I remain,

"Yours fraternally,
 "....."

We had the water from the Wilsey farm analyzed and Prof. Chamot of Cornell University reported colon bacilli.

Now, whether this well water gave Mr. Wilsey "sunstroke" or whether Mr. Wilsey's "sunstroke" infected the well, or whether the infected well is a coincidence, I will leave you to judge. I do know that the infection in Ithaca extended over a number of weeks. Now we have practically no cases.

I think that this picture I have given you should emphasize the importance of considering the milk supply in every typhoid epidemic, in fact, in every typhoid case.

THE CHAIRMAN — We will now proceed to the last paper of the forenoon session, that is, the paper on Vital Statistics, by Dr. Cressy L. Wilbur, Chief Statistician of the United States Census Bureau, Washington.

VITAL STATISTICS

BY CRESSY L. WILBUR, M.D.

Chief Statistician, United States Census Bureau

One of the best definitions of vital statistics that it has ever been my fortune to encounter was that contained in a little sketch entitled "The Studio Girl: A Tragedy; By One of Them," which I recently noted in the pages of the Sunday magazine of one of the great papers: "It is in the quiet blocks of houses where the ordinary persons live that neighborhood grows and folks draw together through church interests, the next-door feeling, the babies, weddings, illnesses, deaths,— those simple big happenings of life!"

Vital statistics is the study of those "simple big happenings of life," especially in their collective aspect as massed together for the city, the State, or the nation; and it is my pleasant duty to endeavor to point out to you to-day how supremely important such study is as the fundamental basis of all the public health work now in progress, or contemplated in future, under either municipal, State, or Federal agencies, or, as we are more and more coming to realize, the effective combination of municipal, *and* State, *and* Federal agencies. "Team work" is a favorite expression of my friend Surgeon-General Wyman of the United States Public Health and Marine-Hospital Service, who has just preceded me upon this platform, and the more generally effective *team work* of all agencies that make for the uplifting of the public health can be brought into play, the more rapidly will the fruits of sanitary efforts be realized in the saving of lives from preventable disease and violence, the curtailment of the wasted hours of pain and misery of the sick, and of the loss and suffering of those dependent upon them, and the building up of a happier, stronger citizenship, both of men and women, for the carrying out of the great destiny of the United States.

VITAL STATISTICS AND DEMOGRAPHY

The knowledge of vital statistics is of value not only within the nation, but also for the very important purpose of international

comparisons, by which alone the relative rank and progress of the United States can be measured as compared with the other countries of the world. It may be well to define the meaning of the word "demography," because I find that it is somewhat unfamiliar even to professed statisticians and sanitarians, and because there will meet at Washington before very long the great International Congress of Hygiene and Demography, formed by the union, many years ago, of the International Congress of Hygiene and the International Congress of Demography. The word "demography," or the French *démographie*, was originated by M. Achille Guillard, the grandfather of Dr. Jacques Bertillon, in his volume on *The Elements of Human Statistics or Comparative Demography*,¹ published at Paris in 1855. As Doctor Bertillon observes in the footnote of his work on the *Elements of Administrative Statistics*, from which the above statement is taken, the word is to-day adopted universally, except that it has received comparatively little acceptance among English-speaking nations. We have no other word, however, that fully corresponds to it, and it would be well, in view of the great International Congress soon to be with us, and in whose title it appears, that we should now naturalize it and bring it into common use. Doctor Bertillon defines it as follows: "*Demography* is the study of humanity in the collective sense. Its object is to know of what elements it is constituted, how it lives, and how it is renewed. Its principal instrument of investigation is statistics."²

The Greek origin of the word is a correct guide to its use. As geography is the study of the earth, so demography is the study of the people that inhabit it (*ἄνθρωπος* people). In its broadest sense, as understood by its creator, "it is the science of all numerical averages which are of interest to humanity." In the more restricted meaning with which we usually employ it, "it is the mathematical knowledge of populations, their general movements, their physical, social, intellectual, and moral conditions." Thus in a recent *Manuale di Demografia* by Napoleone Colajanni of

¹ *Éléments de statistique humaine ou Démographie comparée.*

² *La démographie est l'étude des collectivités humaines. Son objet est de savoir de quels éléments elles sont constituées, comment elles vivent et comment elles se renouvellent. Son principal instrument d'investigation est la statistique.*

Naples, such subjects are considered as the census, number of inhabitants, habitations, and families, composition of the population according to anthropological character, race, language, nationality, place of origin, biological condition (sex, age), disability, social condition (civil condition, religion, education, occupation), marriage, natality, morbidity, mortality, biometry, migration (immigration, emigration, internal migration), tendency to city dwelling, etc. These are classed under the two great divisions of (1) Condition of population (static) and (2) Movement of population (dynamic). To the first, that dealing with the constitution of populations as they exist at a given time, belongs the census; to the second, which traces the growth of populations and analyzes the factors upon which such growth is dependent, belongs what English-speaking persons usually call *vital statistics*, that is, the statistics of humanity concerning those "simple big happenings of life" that come to all of us, and set their indelible impressions upon the history of the race of which we form a part.

CONDITION OF DEMOGRAPHY IN THE UNITED STATES

At a time when we are expecting the arrival of a host of European demographers, many of them trained in the methods of the most advanced civilization, it may be well to consider the present status and prospects of demographic investigation in the United States. Demography is dependent, as we have seen, upon two important factors, (1) knowledge of the *population* which is obtained by means of the census; and (2) knowledge of the *movement of the population*, which can only be obtained by the effective registration of vital statistics. As regards the census of population, the United States occupies perhaps a more advanced position than any other country in the world. It was the first nation to insure, by an organic provision of the Constitution, that regular decennial censuses of population should be obtained as a part of the fundamental law of the land. The Thirteenth Decennial Census of the United States will soon be taken, as of April 15, 1910, and from the first census of 1790 to the present, and undoubtedly for all future time while the United States remains a nation, these decennial censuses may be depended upon to supply all necessary demographic data as to the condition of the people at the time upon

which they were taken. Many States moreover, among them New York, have very complete interdecennial censuses, so that every five years, or at most every ten years, we have a thorough summing up of the people of the United States, together with statistics of agriculture, manufactures, mining, and of other subsidiary inquiries, that meet the demands for full knowledge concerning the condition of the country.

As regards the other and equally important phase of demographic study, the movement of population, the condition of the United States is far otherwise. For a large part of the United States, including practically the entire South except for a few registration cities, we have no vital statistics at all of a reliable character. In no southern State at the present moment is there complete, successful, State-wide registration of even deaths alone. Possibly in not a single State of the Union at the present time — certainly not a few years ago — is there complete, successful, State-wide registration of births; not even so complete that we could be assured that at least nine births are registered out of every ten that actually occurred. You will note that I do not speak definitely as to the actual condition at present with respect to the registration of births. This is for the reason that a special collection was made by the Bureau of the Census of all the births registered in the United States for 1908, and until the compilation has been completed and the data analyzed, I would prefer to speak only in general terms. But it is certain that there are very few places in the United States where *all* births are registered, or even where births are registered with an approach to a fair degree of completeness so that it is worth while regularly to collect them from the State or city registration offices, in accordance with the Act of Congress relating thereto, as the beginning of a registration area for births of the United States. The term "registration area," as used in all the vital statistics reports of the Federal Government since 1880, relates simply to the registration of deaths; which fact is a sufficient commentary upon the present condition of vital statistics in the United States at the end of the first decade of the twentieth century. In no other civilized country in the world is there such gross and utter neglect of the registration of vital statistics, a function which is considered an indispensable part of the duty of a modern progressive nation.

LOSS TO THE CITIZEN AND TO SANITATION FROM NEGLECT OF
VITAL STATISTICS

Important as the proper registration of vital statistics in the United States may be for demographic purposes — and it is not pleasant to have other countries in a position to point to the national neglect of this subject as evidence of the crude and semi-civilized condition of civil administration in the United States — I should not urge upon you solely, or chiefly, the necessity of more adequate registration of births and deaths from this point of view alone. Indeed, I may assume, in this assemblage of health officers of the Empire State of the Union, whose population as determined next year will probably nearly if not quite equal the entire population of England and Wales at the beginning of the last century,¹ and which sustained the terrific struggle of the Napoleonic wars, that neither the disposition nor the *means* are wanting to secure complete registration of every birth and death that occurs in the State. Surely no argument can be needed as to the necessity of recording every death as it occurs, upon a standard certificate of death, and with the absolute requirement of a burial or removal permit to be issued by the local registrar *before* any disposition is made of the body. For nearly thirty years, since the first organization of the State Board of Health of New York, of which the present Health Department is the direct continuation, the importance of correct vital statistics has been iterated and reiterated to the people of the State. From the first annual report, transmitted to Governor Cornell, December 1, 1880, I may quote:

Registration of Deaths, Births and Marriages.— *The Bureau of Vital Statistics.*— The records of the sanitary condition of five millions of people and of the movements of this population, the registry of their mortality and the causes of death, the registry of prevalent diseases and a faithful [mark the *faithful*] record of all [*all*] births and marriages, pertain to the Bureau of Vital Statistics. The necessities of sanitary service, and the interests of communities considered socially and physiologically, alike require that this registration in all its parts be complete, uniform in its

* Estimated population of New York, 1910, according to the method of average annual increase, 8,865,722; of England and Wales, by census of March 10, 1801, 8,892,536.

methods, and faithfully attended to in all its details. With the registration of mortality and its various causes, and with the records of prevalent diseases, sanitary officers have constant occasion to concern themselves; but the other two branches of vital registration are also essentially necessary in the study and establishment of the sanitary defenses of the people.

The registration should be *complete*; and the registration of births and marriages is also *essentially necessary*, as well as that of deaths, to the *sanitary defenses of the people*. To-day, nearly thirty years after these words were written, even the registration of deaths is probably not thoroughly complete in all parts of the State. The comparison made by the twelfth census for 1900 showed that for the counties of New York investigated the ratio of deaths registered under the State law was only 90.6 per cent. of those that actually occurred, as determined by the addition of enumerators' returns, thus falling decidedly below the completeness of registration in Michigan, as determined by the same test, 92.9 per cent. for which State the law had only been in operation about two years and had not then been extended, so far as the requirement of compulsory burial permits is concerned, over the entire State. A marriage license law — the only way in which accurate records of marriages can be obtained — has only lately been enacted in New York. For births reference need only be made to the recent Monthly Bulletins of the New York State Department of Health, so ably edited by Dr. Hills Cole, and which are of course carefully read by you each month, to appreciate how worthless the registration of births remains to-day in many parts of the State. I need not point out to you the exact localities where the enforcement of the birth registration law is totally neglected; the figures show for themselves and attention has been called to them time and time again in the Bulletin and in the annual reports. Some places show, as in the table of city birth rates and death rates for 1908, presented in the Bulletin for February, 1909, a large excess of deaths over births, and pointing to a rapid natural decrease of the population — if the statistics are correct. Probably in most instances, such rates are merely indicative of the gross neglect of effective registration of births. It is difficult to understand the apathy of communities to such continued misrep-

resentation of their vital conditions existing through the neglect of the officials charged with the duty of registration. It is interesting to note, however, as showing the tendency of such neglect to continue for a very long period unless sharply checked by the compulsory enforcement of the law, that some of the places noted in the annual report for 1884 as presenting "glaring examples of such defects" in complete registration due to "inefficiency of organization or carelessness on the part of local registrars" are conspicuous to-day, after a quarter century of attempted thorough enforcement of law, for the same unfortunate conditions. In fact a negligent or careless registrar under a State system, unless sharply called to account and punished or removed from office, is a plague spot that may infect the whole system, and bring about its decay.

NATIONAL IMPORTANCE OF THOROUGH REGISTRATION OF BIRTHS IN NEW YORK

Please do not understand that I desire to criticise or to be unduly severe upon the present condition of the administration of the New York laws governing the registration of vital statistics, and more particularly the registration of births. I have said nothing that has not been said again and again in the official publication of the State, and I am proud, as a former New Yorker, of the history of the State in vital statistics. I am grateful for the impetus received from the eminent men of the past who have had the direction of this work in New York, and I am indebted to-day, in my work as Chief Statistician of the Bureau of the Census, for the cordial support and earnest co-operation that we receive, not only from the State Department of Health under Doctor Porter, but also from Greater New York and some other cities of the State from which we receive independent returns. I shall, of course, always be glad that I was born in Michigan. You will pardon me if I shall always consider it the finest State of the Union in many respects. Indeed Michigan is largely New York, that is, it was settled by New York people who followed the Star of Empire Westward from the days when the "Walk-in-the-Water" plied on Lake Erie. As late as 1890, over 12 per cent. of the native-born population of Michigan at all ages were born

in the State of New York, and of course a far higher proportion of adults, especially in the Lower Peninsula. My maternal grandfather, Dr. Alonzo Cressy, practised medicine for a time in conjunction with his father-in-law, Dr. Justin Smith, at Lima, before he went to Michigan Territory in the 30's. I have some of his old books of account yet, with shilling charges, when a dollar was bigger than an eagle to-day. My paternal grandfather, Jephtha Wilbur, one of the pioneer settlers of the Genesee valley, lived on the old homestead, "down by the willows," just over the Monroe county line, in Livingston county. As a boy on the farm Rochester was "The City" to me — the first city that I ever knew. Later, but over thirty-five years ago, I have memories of school days in old "No. 11"; I have yet the certificate of promotion there received. So I was proud when Michigan was acknowledged by the Federal Census — long before my connection with it — as the first registration State west of New York; and the methods that were employed for the registration of vital statistics in Michigan were largely based upon the methods employed in this State.

One of the greatest vital statisticians and practical sanitarians, in my judgment, who ever labored in the United States was Dr. Elisha Harris, the first Secretary of the New York State Board of Health. Coming to the State work after eminent service as Secretary of the Metropolitan Board of Health of New York City, where he had given special attention to the registration of vital statistics, he early adopted methods which were really the fountain source of the laws of many other States, and which are incorporated in the standard bills of the present day as recommended by the Bureau of the Census and approved by the American Medical Association and by the American Public Health Association. It was never my fortune to know Dr. Harris personally, although his face is familiar as one of the early presidents of the American Public Health Association from an engraving that formerly hung on the walls of the Michigan State Board of Health. But his influence is vital and active to-day, and his ideas are being carried out from the Atlantic to the Pacific in many laws passed during the last ten years. I mention this to show how lasting is the influence of thorough work, and how appropriate it would be for the health officers of the State to resolve to thoroughly carry out to-

day that *complete* registration of births and deaths that Doctor Harris attempted, and which it is now entirely feasible to secure. The language urging the necessity of complete registration that I quoted from the first report was doubtless written by Doctor Harris with the full approval of the members of the Board, the President of which at that time was Dr. Edward M. Moore of Rochester.

The accurate registration of all births has nearly everywhere been neglected in the United States, even where the records of deaths are tolerably complete. It is more difficult to secure complete registration of births, and the great practical importance of such registration, both to the individual and to the State, is not recognized as fully as it should be. In the compulsory burial or removal permit, when faithfully enforced, we have an absolute check to the completeness of death registration; but no such check is possible upon the completeness of birth registration, and the unconscious health officer or registrar of vital statistics may go on in blissful ignorance for years that births are not properly registered in his jurisdiction — unless he chooses to open his eyes and see that they are not. If he really desires to know whether the law is being executed or not, it is very easy for him to ascertain; and it is equally possible for the central office of the State to ascertain and to gauge, with a fair degree of accuracy, just how effective or ineffective the law is for each part of the State. It is only necessary to check up regularly the returns of deaths of infants with the births reported, and to note whether the children born in the city or State and dying under one or under two years of age were registered as births. If they were not registered, then there is a certain penalty of the law for physicians or midwives who fail or neglect to file the certificates of birth, and if that penalty were enforced in each and every instance in which it is incurred, or even in a considerable proportion of such cases, there would soon be an end of defective registration of births.

Is there any reason why the law should not be *enforced*, and the penalty provided therein, which is or ought to be only a reasonable one, applied to every instance of violation? The State aims, primarily, to protect the personal and legal rights of its citizens by establishing accurate records of births which can be relied upon

to prove the important facts contained therein — facts which may frequently be insusceptible of any other proof. The claims of descent, proofs necessary for the inheritance of property, especially from foreign countries, the establishment of school age, age for lawful employment of children, age of consent, voting age, and many other requirements, can be drawn only from accurate birth records made at the time of birth or immediately thereafter. Early notification of births is essential for the prevention of certain diseases, and the total number of births in a State or city is the basis of that most important ratio known as *infant mortality*. The full measure of protection to infant life cannot be extended unless all births are promptly registered, and all the vital statistics of the State are vitiated by the neglect or failure of physicians and midwives to obey reasonable laws for this purpose. Are they to receive general immunity for such negligence, and is it the will of the people of the State that the wise safeguards intended to be thrown around the most helpless and dependent class of the community should be set at naught as if by a specially privileged class who assume to obey or disobey them as a mere matter of personal convenience? The question is one of rapidly increasing importance, as our civilization grows in complexity. Watch the crowds at the office of the Registrar of Records of Greater New York at the Health Department on Sixth avenue, and note the trouble and disappointment, perhaps even the serious loss, that follows when it appears that some careless doctor or midwife in years gone by has neglected his or her duty. The State owes it to the children born that they shall be duly registered under the wise provisions of the State law, and the State owes it to its own self-respect that the law shall be enforced without fear or favor in each and every part of the State. It is a State law; that should be sufficient.

Why are such laws not thoroughly enforced? The answer is simple: Ignorance or incompetency of the local registrar, or fear or favoritism on his part for known violators of the law. The latter reasons are sometimes summarized by the single word *tact*; when a registrar desires a tactful administration, with avoidance of all friction, he can secure it by ignoring violations of the law. Observe that I do not assign any special measure of blame to physicians or midwives for forgetting, refusing, or neglecting to

file their births as the law requires them to do. They are not charged with the *enforcement* of the law. An alert local registrar would very soon obtain evidences of delinquency, and thereafter the sole responsibility should rest upon him if he did not secure the enforcement of the law; and the central office of the State would in its turn be responsible if it permitted negligent local registrars to allow the law to be held in disrespect. You will understand that by "local registrar" I mean, not the man who does the mere mechanical work, but the health officer or head of the office who has the power and the responsibility for its proper conduct.

It is true, and must always be remembered, that the chief agency heretofore available to secure the enactment of vital statistics legislation has been the organized medical profession. Registration of vital statistics is medical work, and medical men have pleaded before Legislatures for better laws for this purpose and have greatly aided in their administration, especially as regards the reporting of deaths when the legal responsibility has been laid upon the undertaker. But when it comes to the actual reporting of births, under laws of their own devising, the physicians of the country have been almost universally delinquent. No amount of moral suasion or urging by those physicians who appreciate the great importance of such laws will induce all doctors to voluntarily comply with them, not even when a quite unnecessary and undesirable fee is paid for such returns. As a concrete example the State Registrar of Pennsylvania, Dr. Wilmer R. Batt, recently stated before the Section on Vital Statistics of the American Public Health Association at Richmond, that under the very efficient Pennsylvania law in force in 1906, for the first year resort was had chiefly to educational and persuasive means. As a result about 167,000 births were registered, exclusive of stillbirths. For 1907 the same measures were continued and a few prosecutions were instituted in various parts of the State. The births registered rose to nearly 176,000. For 1908 a thorough system of inspection was instituted, representatives of the State Department of Health personally visiting localities, obtaining lists of children not registered, as shown on the local records, and prosecuting the delinquent physicians and midwives. Over 500 such cases were taken up during the year, and the city authorities for the most part heartily co-operated in the work. As a result over 193,000 births

were registered for 1908, over 3,000 delinquent returns being made for Philadelphia alone. The work is continuing, territory being revisited from time to time to insure that there is no slackening in the enforcement of law. I have been about with one of the State inspectors myself, at Scranton and Wilkes-Barre, and I can assure you that aside from insuring the enforcement of the law, the work is very important as educating the physicians, the midwives, and the people and press generally as to the necessity for proper registration, and that the law is not a mere form to be obeyed or violated with impunity, but a measure for the protection of the legal, personal, and sanitary rights of the children *that must be obeyed*.

Why should not the same measures be carried out in New York? Why should not the law be enforced throughout the State? Are there any reasons why certain cities should not register their births when the State law requires that they should? In selecting the list of eligible States for the registration area of births, which may be constituted by the Bureau of the Census next year, it is certainly disheartening to contemplate the apparent neglect of complete registration of births now existing in certain parts of New York. A few negligent local registrars cast a reflection upon the entire State service, just as a few doctors or midwives in a community who do not choose to obey the law, and are not forced to do so, soon lead to its general neglect. It seems to me that the organized public health officials of the State and the organized medical profession of the State should *demand* that these laws be thoroughly enforced, and should support the conscientious registration official in the thorough discharge of his duty in requiring the prompt and complete registration of all births and deaths that occur in his jurisdiction.

The outlook was never so hopeful as at the present time for greatly improved vital statistics for the United States. We shall start out next year, at the beginning of a new census decade, with a strong organization of the registration officials of the United States, who have constituted since 1907 the Section on Vital Statistics of the American Public Health Association, of which Dr. William H. Guilfooy, Registrar of Records of Greater New York, is now the chairman. This section has already proved of great service in elaborating rules of statistical practice, which may be found each year in the annual reports on mortality statistics published by the

Bureau of the Census, and which will do much to harmonize and render comparable the methods of compilation and presentation of data in the various State and city reports. At Richmond last month the revised United States standard certificate of death was adopted for general use throughout the United States and has been approved by the Bureau of Census. It will be at once accepted by Doctor Porter for use in New York—in fact, the New York State Department of Health was the first State office that promised immediate adoption. New York is now as prompt as it was in 1901, when its action determined the success of the original standard certificate, of which this is the first revision. As chairman of the committee on vital statistics of the American Public Health Association I was appealed to by the Illinois State Board of Health, which had just secured the passage of a registration law, to draft a form of certificate of death for their use. We had then a very excellent form in Michigan, but it seemed to me that by getting two or three States to agree upon a uniform blank, we might secure the adoption of a standard certificate throughout the United States, and so have a uniform basis for national mortality statistics. Doctor Hurty of Indiana and I therefore agreed that we would use the new blank that we were preparing for Illinois for both Indiana and Michigan, beginning January 1, 1902. Happening about that time to be summoned to Washington for consultation by my predecessor, Mr. William A. King, I took the new blank with me and called on the way upon Dr. Daniel Lewis, then State Health Commissioner, at his office on Madison avenue, New York. Doctor Lewis heartily approved the new form, and when I reached Washington with four States, as we supposed, Illinois, Indiana, Michigan, and New York, a unit for the standard blank, Mr. King at once adopted it for the Bureau of the Census and it has been in very satisfactory use in all of the newer registration States since that date. The chief advantages of the revised blank are a better statement of occupation and cause of death, and the provision for certain definite instructions in regard to their statement, so that the returns of deaths will be more precise.

Another promising line of effort just begun is the co-operation of the American Public Health Association and the American Statistical Association with the Bureau of the Census in the

preparation of uniform forms of tables to be used in city, State, and Federal reports upon vital statistics, so that the reader will be sure to find the most essential data presented in comparable form. The Actuarial Society of America has also appointed a strong committee to co-operate in the preparation of life tables based upon the mortality returns for recent years, so that it is of the utmost importance that the registration should be absolutely complete. Again, the efforts of American registration officials have resulted in the success of the movement for a uniform classification of causes of death, and at the Second Decennial Revision of the International Classification of Diseases and Causes of Death, which was convened at Paris last July by the French Government, the registration officials and medical profession of the United States were specially represented in the Census Commission authorized by the first act passed by the present Congress. The number of registration States (for deaths) has grown from nine in 1900 to eighteen in 1909, including the great State of Ohio recently admitted, and the proportion of the population contained in the registration area now exceeds 55 per cent. of the total population of continental United States. Good laws have been passed in other States, among them Delaware, Missouri, and North Carolina during the present year, and there is active interest in obtaining and enforcing good legislation for vital statistics. All this is for deaths, however, and we must look to our old registration States to show that they can bring up the standard of birth registration so that they can be accepted in the first registration area for births constituted by the Census. It would be a shame indeed if States with comparatively recent laws should surpass them, and be entitled to admission while they remain in the old rut of slack and negligent enforcement of law. I cannot believe that the Empire State will not rise to the occasion, and that every local registrar, every health officer, and every citizen of the State will not co-operate with and earnestly support the State Health Department in the thorough enforcement throughout the State of those registration laws upon which the success of its sanitary work is so absolutely dependent.

THE CHAIRMAN — We will now have discussion on this paper by Dr. Albert Mott, of Cohoes, N. Y.

DR. ALBERT MOTT — As is well known, the division of vital statistics of

the State Department of Health has to deal with returns of the local registrar of vital statistics from the municipalities of the State. The necessity of uniformity and accuracy in the returns has been thoroughly elucidated in the paper just read. We know that the credit of the State service must suffer from heedless and incomplete work and in order to secure proper returns the registrar must understand that the same principle that governs successful business corporations must be adhered to in this work. Every detail must be known, and promptness in the execution of the same will be the only means of obtaining satisfactory results.

Concentration of effort is imperative in order to attain the highest degree of success in any undertaking, and in nothing does the principle apply more directly than in the matter of vital statistics. However, centralization of authority is as necessary as concentration of effort in any business. This work is of fundamental importance for the maintenance of public health, and in order for the health officer to do the most effective work we believe there should be no division of authority, but that he only should be responsible for the proper registration of vital statistics in every municipality.

We know that the health officer would often have to deal with busy and inattentive communities, but he should present the essentials of correct registration not only to the laity but to the medical profession of his jurisdiction and as far as possible secure the co-operation of all classes. Chapter 351, Public Health Law, section 1, says in part: "It shall be the duty of every physician in the State of New York to report in writing, on a form to be furnished as hereinafter provided, the name, age, sex, color, occupation, place where last employed, if known, and address, of every person known by said physician to have tuberculosis, to the health officer of the city, town or village in which said person resides, within twenty-four hours after such fact comes to the knowledge of said physician." Section 3 says in part: "It shall be the duty of every health officer of a city, town or village to cause all reports made in accordance with the provisions of the first section of this act, and also all results of examinations, showing the presence of the bacilli of tuberculosis, made in accordance with the provisions of second section of this act, to be recorded in a register, of which he shall be the custodian." Chapter 396, section 24 of Article 2 says in part: "Every physician shall immediately give notice of every case of infectious and contagious or communicable disease required by the State department of health to be reported to it, to the health officer of the city, town or village where such disease occurs." I have referred to the above items in the Public Health Law to call your attention to the fact that the health officer is made, by these provisions, the registrar of vital statistics for conditions attending the perpetuation of life, excepting births and deaths. The Public Health Law should also require the health officer to have a record of every birth and every death, as prescribed by the State Department of Health. I believe the above are wise provisions, as it gives the health officer proper police power. In order that the health officer may succeed in reaching the largest degree of success in the betterment of the public health, he might have a police power which cares for the health, for the life and for the safety of the community. The Public Health Law provides that the sum of twenty-five cents shall be paid to the physician or person for each case of infectious and contagious or communicable disease reported, and the sum of twenty-five cents for each certificate of birth and for each certificate of death. The provision of a specific amount for such service is a wise one, and will aid materially in securing a complete registration of all cases desired by the department.

As a matter of justice I believe the Public Health Law should be amended so as to provide for the payment of the sum of twenty-five cents for the registration of each birth and death, and for every case of infectious and contagious or communicable disease, and for the granting of each permit for the burial or transportation of the dead, and these provisions should apply to the towns, villages, and cities of the third class in the State. If these suggestions should be adopted in the future and the health officer will co-operate cordially in this matter I am sure we will have a registration of vital statistics in this State that would be superior in quality and completeness.

THE CHAIRMAN—We will now adjourn until 2 o'clock.

FRIDAY, NOVEMBER 12

SIXTH SESSION, 2.30 P. M.

THE CHAIRMAN — The first paper of the afternoon is "Benzoate of Soda in Food," by Dr. Daniel R. Lucas, of New York City.

BENZOATE OF SODA IN FOOD

BY DANIEL R. LUCAS, M.D.

New York City

We can never calculate the causes of disease with mathematical precision.

Fundamental in the study of disease is knowledge of normal structure and function. Here our difficulties are great, for in many organs the structure is exceedingly complex and the function obscure. Regarding the kidney, for example, Sollmann states "in isolating its functions recourse must be had to indirect methods, to deductions and theories, which, in turn, rest on assumptions more or less definitely proven, or more or less probable." Indeed our assumptions are often in inverse proportion to the extent of our knowledge.

Again we always have to bear in mind the condition of the individual and his peculiarities; etiological factors act upon him in various ways. Some persons can swallow without any evil results a quantity of microbes which in the case of other individuals would produce a fatal attack of cholera.

Metchnikoff states "the bodies of men and of higher animals are possessed of a complex mechanism which resists the harmful action of bacteria and their poisons. The various parts of this mechanism may act differently, with the result that there is a great variation in the power of resistance. Thus a multitude of microbes may be in the intestine. They bring little harm to an organism that has a high power of destruction or neutralization of their toxins, or when these harmful products are unable to pass through the intestinal wall. It is in this way that I explain some

exceptions to the general rule, which are exceptions only in appearance."

We have constantly to search for new facts, upon which we must make careful deductions, and then we have to verify our findings by adequate experience. It is, therefore, not astonishing that conclusions of long standing acceptance are made doubtful or wholly replaced by new results of research.

To illustrate: the fact that putrefactive bacteria inhabit our digestive organs and through their activity there produce poisons, which being absorbed act in a very unwholesome manner, has been doubted. Bacteriologists have expressed the opinion that the intestines of man contain scarcely any microbes of putrefactive influence. But recent investigation has proved that the human intestine is constantly the abode of great numbers of putrefactive bacteria.

It is generally accepted as a fact that putrefactive products are toxic. We are not surprised, however, by the observation that the ingestion of a given putrefactive product, e. g., benzoic acid, may cause variable toxic influences in the same individual. Such variations may be due especially to chemical differences in the conditions of administration, i. e., conditions which result in different chemical alterations of the toxic material (and consequently of its effects), such as its conversion into a salt, or its combination with an ingredient of the diet or its absorption by associated matters.

This research was undertaken because of strikingly different experiences with sodium benzoate when taken by mouth in the following ways: (A) Pure, as dry crystalline salt, or in aqueous solutions; (B) in alkaline solutions, or in mixtures rich in fat, carbo-hydrate protein, e. g. milk; (C) in acid vegetables or fruit, either warm, as in tomato soup, or cold, as in canned plums, peaches, tomatoes, etc.; (D) in beverages containing large per cents of organic acids, e. g. cider, grape juice, etc.; (E) in mixtures containing inorganic acids, e. g., artificial gastric juice.

Brunton has compiled data that show the comparative arresting influence of various drugs on the action of ferments (Table 1).

TABLE 1

Comparative arresting action on ferments in aqueous solution

	Emulsin	Myro-sin	Dias-tase	Inver-tin	Ptya-lin	Pepsin	Pancre-atin	Ren-net
Benzoic acid	2100	1100	1025	400	2600	200	2600	300
Sodium benzoate ...	100	20	100	65	86	—	—	50

Comparative retarding influence on the development of Anthrax Bacteria

	Lacroix prevents	Brunton hinders	Brunton kills
Benzoic acid	2800	2000	400
Sodium benzoate	—	200	—

From this table it is seen that the inhibiting action of a given amount of benzoic acid in combined form, e. g., sodium benzoate, is very much weaker than when the benzoic is free. Ordinary commercial sodium benzoate contains about 75 per cent. of the radical of benzoic acid, but whereas one part of benzoic acid in 2,100 parts of water arrests the action of emulsin, 21 parts of sodium benzoate must be present in a like volume to produce the same effect. A similar subordinate relation to benzoic acid is shown by sodium benzoate when comparative toxicity on other enzymes and bacteria is considered.

Fleck found that benzoic acid, in concentrations equal to 0.6–0.7 per cent. caused marked inhibition of yeast fermentation and that the arresting action was materially diminished by an increase in the amount of associated protein.

Lehmann states on the basis of his own experiments that in the presence of relatively large quantities of albumin, or where the reaction is alkaline, neutral or weakly acid, sodium benzoate is not a good preservative. Lehmann observed also that meat extract putrefied in the presence of 1 per cent. to 2 per cent. of sodium benzoate, but a smaller proportion of benzoic acid, acted more strongly antiputrefactive when the reaction of the extract was markedly acid. He also found that the action of sodium benzoate under strongly acid conditions is practically the same as that of an equivalent amount of benzoic acid, but diminishes with decrease of the associated acidity.

EXPERIMENTAL

I have observed that, although no irritating effect is produced in the mouth, throat, esophagus, stomach or intestines by certain proportions of sodium benzoate when taken in cold, fresh milk and into a full stomach, on the other hand, a very pronounced action followed the ingestion of the same proportions of that substance in warm tomato soup on an empty stomach.

Pure sodium benzoate has a sweet, non-irritating taste, and, when added to fresh milk, imparts to the milk a sweet, bland taste, which is not rendered irritating by amounts of benzoate equal to from 3 to 4 per cent. I have observed, however, that smaller proportions of sodium benzoate induce a decided effect upon the flavor of warm tomato soup. Thus, in such soup, sodium benzoate produces the burning, acrid irritation, especially noticeable in the posterior part of the buccal cavity, characteristic of benzoic acid. Sometimes very small proportions produce in especially susceptible subjects the sensation and effects of benzoic acid, such as burning in the esophagus and stomach, followed by nausea, gastric pain, cutaneous warmth, fullness of the head and muscular weakness. This is especially true when the benzoate is taken in warm, strongly acid, fruit juices.

These observations led me to endeavor to answer the following questions:

- a* Is benzoic acid toxic?
- b* Is sodium benzoate toxic?
- c* What is the degree of antiseptic action or toxicity of sodium benzoate, as a vehicle for benzoic acid, when the benzoic acid is liberated from it and allowed to act in the free state?
- d* Has sodium benzoate an undesirable effect when consumed in fruits or other *acid* food stuffs preserved with sodium benzoate?
- e* What are the influences of various diets on the effects of benzoic acid and sodium benzoate?

1 *Effects on micro-organisms*

A Influence on the fermentation of fruit and vegetable juices.

About fifty samples of juice from various fruits and vegetables were used in these experiments. Tomatoes, apples, oranges, plums,

lemons and carrots were used, with the following results: Unpreserved pulp from each of the indicated sources spoiled in from 24 to 48 hours, as was shown by discoloration and the presence of mould colonies.

In the preserved specimens (sodium benzoate 1 per cent.) clear, shining, crystals of benzoic acid separated on the surface of the juices with the strongest acid reactions and in the substance, as well as on the surface, of the pulp specimens. No mould or discoloration occurred in the preserved specimens at the end of twenty days.¹

B Influence on the fermentation of milk.

The observations on fifty samples of milk warrant the following general conclusions:

1 Sodium benzoate (1 per cent.) does not greatly retard the development of the lactic acid ferment.¹

2 Small amounts of sodium benzoate and sodium carbonate both retard the thickening of milk, but similar quantities of sodium carbonate do not prevent its fermentation. Sodium benzoate is distinctly alkaline in reaction. It is probable that it is this alkalinity which increases the fluidity of milk and delays the souring and thickening.

C The action of free benzoic acid on fresh milk.

When fresh milk contains 1 per cent. of added benzoic acid, the thickening of the specimens is delayed very little, if at all. It was observed that, in a very short time after such proportions of benzoic acid were mixed with milk, all taste of benzoic acid disappeared, the specimens assuming a modified benzoate taste, which persisted until a few hours before thickening occurred, when the benzoic acid taste again became evident. It seems obvious that some constituent or constituents of the milk are capable of combining with free benzoic acid and thus preventing the irritating action of benzoic acid on the mucous membranes of the alimentary tract, as well as modifying its taste, when swallowed in sweet milk. The proteins, as well as the alkaline phosphates, may have this property. An inquiry into this matter was made in the following experiment:

Into each of twelve test tubes, 10 c.c of sweet milk were poured

¹ Complete data may be obtained from the author.

and 0.01 gm. of sodium benzoate (0.1 per cent. was then added to each of ten of these portions of milk). (In all previous tests this proportion of sodium benzoate prevented thickening at room temperature for seventeen days.) Decreasing amounts of benzoic acid were then added to seven of these mixtures.

The time of precipitation and thickening indicated that sodium benzoate tends to delay coagulation. The data also show that benzoic acid tends to counteract the retardation of coagulation in proportion to the amount added, and even to hasten the thickening of milk when added in large amounts.¹

From these and the previously mentioned results it may be concluded that one or more constituents of milk have the power of combining with relatively large amounts of benzoic acid, detoxifying it so as to render it comparatively non-inhibiting to the lactic acid ferment and non-irritating to mucous membranes, until the fermentation acidity is developed to a strength sufficient to enforce the presence of free benzoic acid.

2 Effects on men

A Influence when administered in acid fruit, juices, vegetables and milk.

Samples of milk and of tomato (hot and cold), orange, lemon, apple, plum and carrot, containing 1 per cent. of sodium benzoate, were tasted by fourteen different persons. Each subject noted a distinctly astringent, irritating taste. In one subject, suffering from coryza, there was an increase of the nasal secretion, accompanied by lacrymation and coughing. There was belching and passage of gas by rectum. In one subject who had been suffering from a gastro-intestinal derangement for several days, the latter effects were especially marked. The sodium benzoate also caused slight nausea accompanied by abdominal uneasiness, for four hours. (This subject, a man of scientific training and experience, pronounced the material — orange juice plus 1 per cent. sodium benzoate) "vicious stuff." It was noted throughout these tests that the irritating effect varied with the degree of acidity of the vegetable product.

¹ Complete data may be obtained from the author.

The observed effects on taste may be summarized as follows:

Acid fruit juices containing 1 per cent. of sodium benzoate have a biting taste, an effect due to liberated benzoic acid. Milk or vegetable alkaline rendered and treated with sodium benzoate (1 per cent.) did not taste of benzoic acid at any time during the first twenty-four hours after the treatment, but when acid fermentation began in spite of the presence of 1 per cent. of sodium benzoate, the mixtures tasted of benzoic acid. In samples of carrot pulp the stinging taste of benzoic acid was not so evident as with the more highly acid materials. Small volumes of orange juice to which 1 per cent. of sodium benzoate had been added, usually caused burning in the posterior part of the mouth, the throat, the esophagus and stomach.

Apple juice to which a small amount of sodium benzoate is added becomes sweeter but astringent and stinging to the taste, and irritating to the mucous membrane. The presence of 0.5 per cent. of sodium benzoate renders apple juice quite unpalatable, but the presence of 0.1 per cent. may be over looked by subjects not acquainted with the taste of pure apple juice.

After repeatedly ingesting small amounts of fruit pulps treated with sodium benzoate (1 per cent.) two subjects experienced fullness of the head, headache, and a feeling of fatigue and depression. These samples were taken into empty stomachs. The results show that benzoic acid, liberated from sodium benzoate by acid fruits and vegetables, is sufficiently irritating to cause gastro-intestinal disturbances, as well as general systemic symptoms.

These preliminary observations were followed by an investigation to determine some of the possible effects of food products preserved with sodium benzoate as allowed by law, and as customarily consumed, e. g., apple juice containing sodium benzoate and taken principally between meals. ("It having been determined that benzoate of soda mixed with food is not deleterious or poisonous and is not injurious to health, no objection will be raised under the Food and Drugs Act to the use in food of benzoate of soda." Food Inspection Decision 104, U. S. Dept. of Agriculture, March 3, 1909.)

Applejuice was used in this part of the study. The quantity of apple juice generally administered was a volume equal to the

average quantity of pure apple juice consumed under normal conditions by the subjects. This "normal" amount was determined by placing freely at the disposal of the subjects five gallons of unpreserved, untreated Baldwin apple juice from cold storage at 32°F, "pressed" and stored one month previous to its use, and which was in a state of perfect preservation. Assistants in this laboratory and various attaches of the college, twenty in number, drank freely of the juice. It was requested of them that a careful record be returned of the amount each consumed. Question blanks regarding symptoms and effects were filled in and returned by the subjects. The average amount of cider consumed by these subjects, men who were busy with their regular work, was 1,200 c.c. Amounts up to 1,500 c.c. were taken rapidly as a rule, while those who drank as much as 2,500 c.c. usually consumed the total volume in two main portions at intervals of two or three hours.

B The effects of pure apple juice.

Pure apple juice is a bland, acid liquid. It does not produce a stinging sensation in the throat when swallowed. The pure juice used in these experiments had not been processed in any way and was very rich in pulp. It had a total free acidity of 2.916 gms. per liter (calculated as acetic, or 3.254 as malic acid). Of this pure juice 100 c.c. yielded to ether 0.002 gm. of sticky extractive. Of an aqueous 0.1 per cent. solution of sodium benzoate, 100 c.c. yielded to ether 0.0007 gm. of oily extractive, but 100 c.c. of apple juice containing 0.1 per cent. of sodium benzoate, yielded to ether 0.0827 gm. of extractive. The extractive was a white crystalline product. Amounts of benzoic acid (0.0874 gm. equivalent to those in 100 c.c. of cider containing 0.1 per cent. of sodium benzoate, but dissolved in 100 c.c. of water and neutralized with NaHCO_3), yielded to ether 0.003 gm. of sticky extractive material.

I was unable to find unpreserved apple juice in this city, the dealers in cider in New York informing me that for six months or more they had not had on hand any cider that was not preserved with chemicals such as sodium benzoate or salicylic acid, or both.

The pure apple juice, when consumed in volumes larger than 500 c.c., promptly caused considerable diuresis. The specific grav-

ity of the urine was greatly decreased when a liter of pure apple juice was consumed. Volumes larger than 1,000 c.c. gave in some cases laxative effects. Several subjects who drank 2,000 c.c. experienced no laxative effects.

The results observed were constant diuretic and occasional laxative effects, immediate feeling of fullness, and the accompanying contentment. The average amount of pure apple juice consumed during three hours by adult males who had free access to it was 1,370 c.c. The consumption of 1,000 to 2,000 c.c. of pure apple juice caused neither headache, nausea, albuminuria, subnormal temperature nor vomiting in any instance.

C The effects of benzoated apple juice.

a First experiment.

Twenty-four subjects were observed in the first experiment. Twelve received pure apple juice; twelve received samples of the same apple juice containing 0.1 per cent. of added sodium benzoate. As none of the subjects knew that they were to receive at this time anything but pure apple juice, unfavorable psychological influences were eliminated from the experiments. Each subject received three question blanks to be filled out by himself daily, so long as any symptoms might last.

The twelve men who took the apple juice containing 0.1 per cent. of sodium benzoate noted on their question blanks collectively the following symptoms: stringent peppery taste, fullness of head, frontal headache, nervousness, belching, griping, passing of gas by rectum, unusual perspiration, nausea, dry mouth, itching of skin and scalp, pain in the stomach, vomiting. There was also irregularity of the bowels (constipation frequently), decreased flow of urine, increased specific gravity of the urine and albuminuria. The average volume of benzoated cider taken in two experiments was 1,090 c.c. and the corresponding amount of ingested sodium benzoate (benzoic acid) was 1.09 gm. Excessive amounts of hippuric acid were eliminated, especially during the first few hours after ingestion of the benzoated apple juice coincident with the tendency to decreased volume of urine secreted.

From careful analysis of all the data it is apparent that small

proportions of benzoic acid in cider caused unusual variation of blood pressure, temperature and pulse, decrease in the normal volume of urine secreted in the first three hours after ingestion, and corresponding increase in the specific gravity, in spite of the ingestion of the great volume of fluid. Albumin appeared in the urine in a number of cases. The urine also caused marked reduction of Fehling solution in a number of cases.

If the apple pulp, protein, etc., is filtered from cider, the effects of the added benzoate on the upper alimentary tract become much more decided.

I was able, however, to ingest 1,000 c.c. of such apple juice containing 0.5 per cent. of sodium benzoate without any albuminuria arising. The amount of hippuric acid in my urine for the first few hours thereafter was excessive. The secretion of urine was very much reduced for twelve hours, while I suffered from some of the other symptoms above mentioned, *although as a subject in a former investigation I ingested, without the slightest discomfort, larger amounts taken in milk and on a full stomach.*

I previously reported, at meetings of two different scientific organizations, the results of experimental work in this relation in which over forty different human subjects were observed and a number of animal experiments performed.¹ The data obtained is so voluminous that it is impossible to give here any of it *in extenso*.

I wish, however, to submit for your criticism the somewhat detailed account of the experiments on one of the subjects in the above mentioned investigation.

This subject, a medical student, good habits, twenty-three years of age, weighed 120 lbs. While not a robust individual, was considered in good health at the time of the investigation. About one year previous to the investigation he had not felt well and was examined by Dr. S. J. Meltzer, who informed him that there were no evidences of heart, lung, or kidney trouble. Several months subsequent to this time he was again examined by another physi-

¹ Jour. A. M. A. vol. liv, No. 10, p. 759, Mar. 1910.

cian in private practice, who also made negative reports of the physical and analytical findings. During the ten days previous to the taking of benzoate, his urine was examined at four different times, on each occasion for albumen, with negative results. During the month previous to the beginning of this investigation, his urine was examined at numerous intervals by three different persons, in connection with some other studies, at all of which albumin was tested for and not found.

Between March 5 and 17, 1909, the subject tasted small amounts of various acid foodstuffs such as orange and lemon pulp, and apple juice containing 1 per cent. of added sodium benzoate. He also tasted pure sodium benzoate in the form of the dry crystals, and in solution, pure benzoic acid under the same conditions, also milk containing each of these substances, etc. The amount of drug taken did not exceed $1/10$ of a gram at a dose, the maximum amount per day did not exceed $1/2$ gram, up to March 18th. The tests were made between 10 and 12 a. m. or 4 and 5 p. m. therefore presumably on an empty stomach; they were made for the purpose of determining the difference in the taste of benzoate and benzoic acid when taken in the various above mentioned ways. The subject did not feel well on the 15th and 16th complaining of headache and fatigue, and albumen was found in his urine on the morning of the 17th. No benzoate was given on that day, but at 12 o'clock at noon the subject was given 1,000 c.c. of absolutely pure and unfermented Baldwin apple juice, which he drank with relish, and rather rapidly.

It was found that the trace of albumen in his urine of the 17th was decidedly less after drinking the cider and until the next test on the following day.

The following are his notes made at the time of experiment on March 18, 1909 and thereafter.

"Took 500 c.c. (apple juice) at 11:45 o'clock, drank it fairly rapidly, then at 12 o'clock took 500 c.c. to which had been added one gram of sodium benzoate. Had a mean, burning taste. Drank last portion slowly. At 12:15 had a heavy and uneasy feeling in the region of my epigastrium. Ate very little lunch. At 12:35

had a heavy movement of the bowels which was acid in character and watery in consistency. At 1:15 had a watery movement which was acid in character. Had a congested and uneasy feeling in head and sweat quite a bit. The feeling of heat and uneasiness disappeared about 3 o'clock and I felt first class after that. ("Another movement, the feces were amphoteric"). A slight trace of albumen was present in the urine of the 18th (probably but little of the benzoate was absorbed).

Friday, March 19th. Took 500 c.c. of cider at 11 o'clock, followed with 500 c.c. of cider containing 5 gm. of sodium benzoate. Had a mean burning sensation. At 11:45 was very nauseated, belched a good deal and felt queer in the head. At 12 o'clock felt flushed and uneasy, sweated, nausea still present but better, pulse was 105, temperature 97°F. At 12:30, feeling much better; 1:50, belching and griping; 2:00, had a little to eat but not much of an appetite; 2:10 had a little movement of bowels (movement was very hard); 3:00 felt miserable, pain in my abdomen, peculiar feeling in my head and general uneasy sensation. Went home, 3:30 to 4:30, slept a little but on getting up felt restless and extremely nervous. Tried to move my bowels but could not. Temperature 98°F, pulse 92 and irregular; 5:30, feeling more easy but still queer in epigastric region and head; 7 o'clock feeling fairly good, a little bit flushed and have belched a good deal, also tympanites; 8 o'clock feeling fairly good but slightly uneasy. Retired at 10 o'clock. (There was a very heavy precipitate of albumen present in the urine of this day.)

March 20th. Had a very poor night of it, being restless and uneasy. At 9 a. m. temperature 96.8°F, pulse 92. Felt exceedingly weak all morning and quit work at 12 o'clock, urine contains a good deal of phosphates and albumen. Took a nap and felt decidedly better. 2:30, pulse 82, temperature 97°F.

The quantity of albumen in his urine was 1/2 gram per 100 c.c. (The precipitate obtained in the heat and acetic acid test was filtered out and added to 95 per cent. alcohol and was found to be insoluble, thereby ruling out the possibility that the precipitate might be resinous material.)

On account of the very bad condition of the subject on March 20th the dosage was not repeated; however, the amount of albumen in the twenty-four hour specimen equalled $\frac{1}{2}$ gram per 100 c.c. The large amount of phosphates in the urine subsequent to the dose of benzoate was striking. No dose was given for the following six days, the albumen gradually disappearing from the urine as follows (24 hr. samples):

March 21.— $\frac{1}{2}$ gram per 100 c.c.

March 22.— $\frac{1}{4}$ gram per 100 c.c.

March 23.— $\frac{1}{4}$ gram per 100 c.c.

March 24.—Only a very slight trace of albumen.

March 25.—No albumen.

March 26.—No albumen.

On the 21st and 22d the subject showed puffiness of the eyelids and swelling of the face, which was so perceptible as to cause comment by people who were uninformed regarding the treatment of the subject.

On the 27th the morning urine was free from albumen and at 11 a. m. 1,000 c.c. of cider, containing 1 gram of added sodium benzoate (0.1 per cent.) were taken.

Previous to taking the adulterated apple juice, the pulse was 98, the temperature 98.2, and the specific gravity of the urine 1.010; 45 minutes after taking the adulterated cider the pulse was 104, the temperature 98.9 and the specific gravity of the urine was 1.030.

It had been frequently noted in other subjects that when benzoic acid was ingested a primary heightening of temperature occurred shortly after its ingestion, followed by a prolonged reduction of temperature and irregularity of the pulse. Albumen was present in the subject's urine for the next four days (no benzoate given) during which time the subject did not feel very well. From April 1st to 5th daily observations were made on urinary volume, specific gravity, albumen, reduction of Fehling solution, indican and reaction. (See Table II.) The amount of urine secreted from 10 p. m. April 5th to 9 a. m. April 6th was 330 c.c.

TABLE II

Subject M. G. H. No. III. Date, 1909.	Sed. B. Dens. gram.	Adminis- tered in 0.2% HC1 c. c.	Volume C. C.	Sp. G.	Albumen gram. per 100 c. c.	Fehling s. uction.	ndican reaction.	Reaction to litmus acidity.
April 1.....	0	0	1250	1023	0	0	Normal....	+
April 2.....	0	0	1100	1022	0	0	Normal....	+
April 3.....	0	0	1156	1021	Trace	0	Normal....	+
April 4.....	0	0	1156	1020	..... 0	0	Normal....	+
April 5.....	0	0	1150	1020	..... 0	0	Normal....	+
Average.....	.....	.....	1187	1021	+ trace	No reduction	Normal....	Acid.
April 6, 9 A. M.....	0	0	330	1017	0	0	Normal....	+
April 6, 11 A. M.....	1	50	.....	.....	.....	.....	Normal....	+
April 6, 4 P. M.....	.....	.....	200	1037	1-16	Reduction....	Normal....	+
April 6, 5 P. M.....	1	50	.....	.....	.....	Reduction....	Normal....	+
April 6, 8 P. M.....	0	0	96	1025	.....	Reduction....	Normal....	+
April 6, 10 P. M.....	0	0	110	1027	.....	Reduction....	Normal....	+
13 hours.....	2	100	405	Av. 1026	Gt. excess	Reduction....	Normal....	Increased acidity.
Total, 24 hours.....	.....	.....	735	1023	Gt. excess	Reduction....	Normal....	Increased acidity.
April 7.....	0	0	1500	1027	Trace	Reduction....	Normal....	+
April 8.....	0	0	1200	1027	Trace	Reduction....	Normal....	+
April 9.....	0	0	1300	1017	Trace	0	Normal....	+
April 10.....	0	0	1250	1021	Trace	0	Normal....	+
April 11.....	0	0	900	1020	.....	0	Normal....	+
April 12.....	0	0	.....	.....	0	0	Normal....	.....

* Total twenty-four hours not saved but samples showed no albumen.

No albumen present, specific gravity 1.017. At 11 a. m. on the 6th, 1 gram of sodium benzoate was given in 50 c.c. of 0.2 per cent. HCl and the dose was repeated at 5 p. m. The volume of the urine was markedly decreased, the volume for 24 hours including the 330 c.c. passed previous to the dosage amounted to only 735 c.c. as against a daily average of 1,187 c.c. on four previous days. The specific gravity was markedly increased, and albumen appeared in large amounts within a few hours after the first dose and was increased by the second dose, and continued present for five days when it again disappeared. The movement of the bowels was normal on the morning of the 6th before the benzoated cider was taken, but the bowels were constipated for the subsequent five days. (See Table II.)

At this point in the experiments the subject was compelled to give up his work on account of the illness of a member of his family whom he nursed constantly, and he was unable systematically to observe his own condition. He informed me, however, that about one week later, at the end of a thirty-six hour period of work, a specimen of his urine did not show any albumen.

DISCUSSION

The results of this investigation show that sodium benzoate is a poor preservative under some conditions. My observations in this regard confirm the findings of Lehmann and others.

In experiments in which I took sodium benzoate in milk, which I ingested from time to time during meals, there was a feeling of malaise. The ingestion at the beginning of meals of acid foods, however, such as tomato soup, plums, peaches, etc., containing added benzoate, was followed in a few days by sharp pains, which set in about thirty minutes after meals and continued for one or two hours. These pains were aggravated by any muscular effort such as the carrying of a heavy satchel. I, therefore, returned to the previous method of ingesting the benzoate, i. e., in milk. The symptoms of gastric irritation then gradually entirely disappeared, in spite of the fact that about three days afterward the dose of benzoate was increased from 2.5 to 3 grams per day for three days. During the succeeding three days, the daily dose was increased to 6 grams, taken on a full stomach in milk, without the

slightest discomfort. As I desired to continue the work until it was completed, I did not repeat the ingestion of large doses in acid food.

The important general difference between my results and those of some previous reports is due, I believe, to the fact that in this research free-benzoic acid was the active factor (whereas in others the benzoate may not have been appreciably decomposed into the free acid, or was accompanied by materials which rendered the benzoic acid relatively inert), which was taken in a way quite connatural to the usual ingestion of certain fruit juices, i. e., apple juice, grape juice, raspberry juice, etc., especially recommended for individuals with kidney affections, because of the absence of any natural benzoic acid.

Such a deduction is in harmony with what we know of the comparative effects of salicylates and free salicylic acid, for example; the acid is much more irritating in its effects than the salt.

Sodium benzoate is effective as a preservative when it yields free benzoic acid. The influence of benzoic acid is, therefore, the essential question in a study of sodium benzoate as a preservative.

Further investigation is contemplated, especially on the influence of nephrectomy on the toxicity of sodium benzoate and benzoic acid.

I am indebted to many of my associates in the Purdue University Alumni Association of New York City for volunteering as subjects in this investigation and thus making it possible for me to carry out experiments on a large number of individuals. The secretary, Mr. Leslie Huxtable, Mr. Ray C. Ewry, Mr. R. W. Parks, Mr. F. M. Walts and Mr. H. Worsham of that organization have given me special assistance in various ways. I am also indebted to Drs. A. E. Olpp and Matthew Steel and Messrs. Herzfeld and Bisch for co-operation, and to Drs. Foster, Mosenthal and Rosenbloom for assistance. Professor Gies has given me all the facilities of his laboratory for conducting this research, as well as valuable criticism and suggestions.

DISCUSSION

PROFESSOR V. J. CHAMBERS of The University of Rochester — Before starting the discussion of this paper, as that is what I am to do, and not to give an independent paper, there are one or two points in Dr. Lucas' paper which I would like to be set right on. In his experiment on the cider with benzoic

acid and the cider without it, in one report I have of the late Denver speech, it is reported as giving discomfort in both cases. The subjects who had the cider containing no benzoate, had none of the headache whatever, I understand now. Didn't they have a certain amount of the same symptoms?

DR. LUCAS — I do not find that pure apple juice could be considered as the cause of headache in any of the experiments which I have performed.

PROF. CHAMBERS — The reason I asked the question is that in the report of the Denver address, which is similar to this, it is stated that you said that pure cider had given feelings of discomfort. Twelve men who received it during the first experiment showed the following symptoms: Fullness, belching, griping.

DR. LUCAS — I have collected a large amount of data, which it would be impossible to give at this time. You notice how long it has taken to give the data of even one of the tests. During the time of the investigation some of the subjects noted symptoms, all of which are recorded in the study as a whole, and which I have omitted from this report for the sake of clearness and brevity.

PROF. CHAMBERS — Then I will assume this is correct here?

DR. LUCAS — Yes, sir.

PROF. CHAMBERS — Then in your description of that one detailed case of the mechanical engineer, you give the effect of feeding the benzoated cider?

DR. LUCAS — Yes, sir.

PROF. CHAMBERS — Did you try the effects without the benzoate?

DR. LUCAS — Yes, sir.

PROF. CHAMBERS — What was the result?

DR. LUCAS — There was no discomfort, or positive analytical findings.

PROF. CHAMBERS — No feeling of discomfort whatsoever?

DR. LUCAS — As I have said, I could not give the complete details and all of the sidelights, but have given an abstracted statement.

PROF. CHAMBERS — In preparing my discussion, I had to rely on the paper presented in Denver.

While this paper of Dr. Lucas's is primarily the effect of sodium benzoate in a more or less acid fluid, cider, it seems to me — although I believe he does not wish it to be meant so — to assume a much broader meaning. The experiments as he recorded them would apply to any acid foods, and not merely to cider; and I shall discuss the paper, with that point in view, making the application broader and more extended than he intended when he wrote his paper. That is what everybody will understand.

On May 4, 1909, was issued the report of the Referee Board of Consulting Scientific Experts of the United States Department of Agriculture, entitled "The Influence of Sodium Benzoate on the Nutrition and Health of Man." This report contains an account of the most exhaustive piece of experimental work ever performed on this question, and the conclusions reached by this Board are as follows:

1. Sodium benzoate in small doses, under 5 grams in a day, mixed with the food, is without deleterious or poisonous action, and is not injurious to health.

2. Sodium benzoate in large doses, up to 4 grams per day, mixed with the food, has not been found to exert any deleterious effects on the general health, nor to act as a poison in the general acceptance of the term. In some directions there were slight modifications in certain physiological processes, the exact signification of which processes is not known.

3. The admixture of sodium benzoate with food, in small or large doses, has not been found to injuriously affect or impair the quality of nutritive value of such foods.

In the May 26, 1909, number of the proceedings of The Society for Experimental Biology, we find a paper by D. R. Lucas, entitled "Some Effects of Sodium Benzoate." The contents of that paper, together with certain additional experimental results, were given by the same gentleman at the Denver meeting of the Convention of State Food and Dairy Commissioners, held at Denver, August, 1909. Dr. Lucas's work is divided into three parts: 1st, effects on micro-organisms; 2d, effects on man; 3d, effects on dogs. The latter one he has not touched on to-day. His results are at variance with the results

obtained by the Referee Board; and I want to quote Dr. Lucas perfectly correctly here, and he says in this, which is a duplicate of what he has just given us, as far as this is concerned: "The important general difference between my results and those of previous observers is due, I believe, to the fact that in this research free benzoic acid was the active factor, whereas in the others the benzoate was not appreciably decomposed into the free acid or was accompanied by materials which rendered these benzoic acids relatively inert."

He claims, and justly, that in practice it is used in such more or less acid foods as tomato ketchup, cider, grape-juice, canned fruits, jams, lemonade and so forth. I do not know that he put all of those in, but those are the things in which we know it is used.

Now this claim of his rests primarily on the assumption that sodium benzoate administered in milk, as it was, to a large extent by the Referee Board, is still sodium benzoate after it has passed into the stomach and become mixed with the stomach contents; and that it is, therefore, in an entirely different state than if it had been administered as benzoic acid. That is the crucial point, it seems to me. The Referee Board gave the material in milk, which is not an acid food to any extent. He gave it in an acid food; as he says in the latter part of his paper, he believes the difference in the results to be due to the fact that he worked with it in a normal condition, such as is natural. I say that he says that by inference, but he does not state that. It must be so, however, as I have inferred from his paper. First, we have to examine whether this assumption is warranted. I will now show you such an assumption is entirely unwarranted by the known chemical and physical facts governing the case.

Professor Herter, of Columbia University, in his discussion of the work of the Referee Board, before the Denver meeting, above referred to, made the following remark: "Another reason why no investigation of free benzoic acid was undertaken, is because in normal stomachs secreting hydrochloric acid, it is likely that the liberation of benzoic acid from sodium benzoate takes place in the acid contents of the stomach, or, in other words, that this liberation of acid gives rise to conditions similar to those which would be obtained from the introduction of benzoic acid in small quantities."

Now let us examine the question from the chemical and logical standpoint. In the first place, benzoic acid is a very weak acid, and it could not exist as soft, sodium benzoate in the presence of the stronger acids, in large amounts.

We then come to the question: Is there an acid present in that stronger than is present in the milk, and stronger than benzoic acid? There is.

We have the acid coming from three sources: First and most important is the gastric juice, which according to Wood, contains from one-tenth to three-tenths of hydrochloric acid; and according to other authorities, even higher, one giving it as high as .5. I have taken the least figures, those given by Wood, one of the professors who is looked upon as an authority. Then we have, according to Gambie, the fermentation process going on all the time in the stomach. Finally, there is acid taken in with the food, as no one takes a meal without getting more or less acid in the food. We find that there is a chance for the acid to get there in the stomach, and the fruit acids ingested in the meal must be considered.

Then we consider the next question: Is it there in sufficient quantity to liberate the benzoic acid? I think I can say it is.

Using the average data given by Wood, Gambie and others, we find there is sufficient gastric juice to free fifteen grams of sodium benzoate. Fifteen grams of sodium benzoate is the amount present in thirty pounds of food. We find by the same data, we find that there is fifty-two times as much as is necessary to liberate the benzoic acid. The claim that part or all of this hydrochloric acid is used up in combining with the protein of the food has no bearing on the question as these chemical combinations are so weak and of such an unstable character that water itself will accomplish a partial decomposition. The hydrochloric acid leaves the protein combination, and acts on the sodium benzoate. So you see, figuring from known data, we have enough acid in the stomach to effect this liberation.

I thought it wise to try it experimentally, and so I had it carried out under

my instructions. Two hundred and fifty cubic centimeters of good milk were treated with sodium benzoate. It was allowed to stand one-half an hour. It curdled at once under the influence of hydrochloric acid; and then the mixture was analyzed for benzoic acid by the usual method. We put in 12/100 of one per cent. of sodium benzoate, and we obtained as benzoic acid 10/100. I think that pretty well answers that question, that after the addition of the dilute benzoic acid, the preservative is there as benzoic acid.

In the light of the chemical and physiological facts given, we are forced to the conclusion that in the experiments of both the Referee Board and Dr. Lucas, the preservative was present in the milk in the same condition, namely, as benzoic acid.

The experiments being the same, then, as far as the actual condition of the preservative is concerned, we next turn to a comparison of them, as to which were carried out under the more normal conditions; which were the more comprehensive and thorough, and which were directed by men of greater experience in carrying out and interpreting the results of researches of this kind. The experiments of the Referee Board were carried out with as close an approach to the actual conditions of living as possible, so that if any unfavorable results should arise, they would have to be due to the only unknown factor in the experiment, namely, the preservative.

The experiments of the Referee Board were carried out in something of this order:

In the first place, the subjects were fed and a careful examination made of all body processes in order to find what the normal condition of the health of the individual was. Then they were given sodium benzoate, and a most exhaustive examination made to see whether that sodium benzoate had any effect upon the value of the food or disturbed in any way appreciable the body processes. Dr. Lucas's experiments he has outlined to you. His experiments on the group—I think Dr. Lucas made only one experiment—it was one evening's work in the administration of material. The experiment on that one particular individual which was recited in considerable detail, was carried out for a longer time, about two weeks, I think it was.

DR. GOLER—Mr. Chairman, this paper was not down for discussion.

DR. THOMAS—Now, as regards the comprehensiveness of the experiment. They carried out experiments for more than four months. As regards the question of whether those experiments were carried out under the most normal conditions, they gave the material in the food, and in the way we would get it. Whereas Dr. Lucas gave it in cider, not with meals, but after meals; and, although it may be the normal way of taking cider, it is not the normal way of taking sodium benzoate or any food preservative of that kind.

The Referee Board obtained no unfavorable results. Dr. Lucas did.

How shall we explain that? The material is the same in both cases, and yet in one case they got bad results, and in the other they did not. It seems to me Dr. Lucas's experiments can be explained on the assumption that it was not the preservative but the excessive amount of cider which his subjects took. I know some of us are very sensitive to the action of cider. I should myself be somewhat concerned about taking the large quantities which he administered.

On the result of albuminuria, he got albuminuria, with cider containing sodium benzoate. Now he did not get it with all of his people; and in the next case Dr. Smith of New York has had similar experiments, and reports no albumin. Dr. Herter obtained none. Dr. Wiley, in his study of sodium benzoate, carried out experiments for twenty days on six individuals, all of whom were fed sodium benzoate, and no albuminuria was noticed.

Now Dr. Lucas only got albumin in some of his cases. It seems to me that it was the excessive amount which he used. The whole question is—

DR. GOLER—The whole question is: Do we want benzoate of soda or any other such preservatives in our food?

THE CONFERENCE—No!

DR. GOLER—Then that is all there is to it.

THE CHAIRMAN—We will now hear from Mr. Harding—Professor H. A. Harding, of Geneva, on "The Control of a Milk Supply."

THE CONTROL OF A MILK SUPPLY

BY PROF. H. A. HARDING

Geneva, N. Y.

During the past five years there has been a growing interest in the subject of a better milk supply. In some of the larger cities this has led to an active study of the problem on the part of the health authorities but in the larger number of the medium sized and smaller cities of the State the milk supply has not been materially affected. This is largely due to the fact that the problem in the smaller cities is quite different from the one which is being solved in such cities as New York, Buffalo, Syracuse and Rochester and the experience gained in these larger cities is not easily applied to the smaller ones.

How shall we control the milk supply of the smaller cities? The true answer is that we can not control it. We might as well admit that to begin with. On the other hand, if we are tactful, we can so manage affairs as to rapidly improve it. Our ability in this respect is based on the fact that practically every one connected with the business is desirous of a better product and it only remains for us to so direct these forces that the proper end shall be accomplished.

In taking up this milk problem let us not forget that the milk business is a commercial proposition which must yield a reasonable profit to the milk man if it is to be run at all. To be a progressive dairyman, a man must be making something more than a bare living. A business man who is only making enough to keep body and soul together is not one with whom we can labor profitably in our progress toward better things.

Geneva has a population of about 14,000 and its milk is supplied by about 500 cows. The milk business gives employment to about 100 people. A modest estimate of the capital invested in the business is \$125,000.

Have we any other line of business in any of our cities with a capital of \$125,000 and 100 hands on the payroll where we would

undertake to arbitrarily dictate the details of conducting the business? In any similar case would we not consult with the management of the plant and confine our recommendations to a general statement of the end to be attained, leaving it to the business management to arrange the details? Do we so thoroughly understand the running of the milk business that we are in a position to draw up detailed statements of the way in which milk shall be produced which shall look sensible to the man who is actually in the business?

The two health departments which have been pioneers in this work in this State are those of New York and Rochester. If there are health officials in the State who are qualified to draw up directions for the production of sanitary milk it surely is the officials connected with these cities. It is a well known fact that New York city has met strenuous opposition in its efforts. A considerable part of the distrust which the farmers feel toward this department is due to a clause in their dairy regulations that the stables must be cleaned before each milking. That seems like a sensible requirement and one tending to sanitary condition if one is not familiar with dairy matters. Those who are familiar know that the removal of the manure in the morning creates such an odor as to make it desirable to delay milking for a considerable period. The effect of the regulation is to convince the producer that he is being dictated to by some one who knows nothing about the business and his tendency to co-operation is destroyed.

The Rochester regulations while good in the main require the rejection of the fore milk. Under conditions as they exist in the milk supply of Rochester there is practically nothing to commend this ruling while the producer is aggravated by the continued and really unnecessary loss of even this small part of his product.

If these departments with the amount of study which they have given to the subject make these untactful mistakes how much more shall we stumble in any attempts at direct regulation. In our attempts at improving the conditions of our local milk supply let us then start with the agreement that we will not attempt to specify the details of the business.

If we are to guide the milk business of our communities into higher and cleaner channels there are a number of things which we must remember:

1. That the law of supply and demand is fundamental to every business proposition. In the past it has been practically impossible for the consumer to know anything accurately concerning the sanitary quality of the milk which is on the market. If you can furnish him with this information it will be a long step in assisting him to get the best article which is to be had at the common price. If the facts of the local market can be made clear to both the producer and the consumer the law of supply and demand will regulate both the quality and the price.

2. That each milkman has a natural pride in the reputation of his product and in a community where each consumer knows something of the producer this is an efficient lever in improving quality.

3. If we are to obtain and hold the confidence of the producer we must serve his real interests as carefully and faithfully as we do those of the consumer.

4. That much of the injury to the milk occurs because of the ignorance of the milkman. We should strive to lead him kindly to a knowledge of better things.

5. That clean milk is not a commercial possibility at present. Really clean milk under present conditions costs about fifteen cents a quart to produce and at this figure it is an impossible commercial article. Let us strive to see that our local supply gradually becomes less dirty than at present. The dirtier the present conditions the easier it will be to start changes for the better.

6. That it is illogical to expect to raise the entire local milk supply to a dead level of quality. There are the same reasons for different grades of milk as for different grades of cotton cloth. Any one who has thought on the subject recognizes that a higher sanitary quality is desirable for feeding babies and invalids than for cooking purposes. While the amounts of fat are somewhat important from the food standpoint the main differences in the milk supply lie in the presence of varying amounts of cow dung and of germs of animal diseases. Let us help the public to determine the real quality and buy intelligently. It is, of course, understood that we should cut off at once any milk which has been exposed to diseases such as typhoid or diphtheria, but the tuberculosis situation is too complicated to permit us to act so summarily in this case.

In order to make these statements more clear in their application let me call your attention to the way they were applied at Geneva. This is a city of about 14,000, with a mixed population, largely engaged in manufacturing. Our first step was to call the milkmen together and explain that we did not intend anything revolutionary, but that we intended to put the facts regarding the production of milk squarely before the public after we found out what the facts really were. They were at liberty to produce milk in practically any way they wished, but were not to take it unkindly if we later reported their carelessness to the consumers.

The next step was to get an inspector and we had the usual struggle with the civil service commission, and drew a man who knew from which end of a cow milk was to be expected, but that was about the limit of his practical knowledge of sanitary dairying. He was a good, bright fellow and after some training came to do his part very well. He is now attending the Dairy Short Course at Cornell University and will be in condition to be of real assistance in the work. If we are to get good results from this dairy supervision it must be done by some one who really knows something more than the general principles of the business and we shall have to look to the Cornell Dairy School for our men in most cases. I know of no other place where a man can get such training. It will cost him about \$75 for the course.

The next need is for a simple basis for expressing the results of the inspection — a score card. There are three or four score cards in use and the object of all of them is to express in a comparative way the actual conditions to which the milk has been exposed. None of them are perfect and any of them are usable. My preference is for the Cornell Score Card, devised by Professor, now Commissioner, R. A. Pearson. A copy of this card is here given and samples may be obtained from the dairy department, Cornell University.

DEPARTMENT OF DAIRY INDUSTRY, COLLEGE OF AGRICULTURE, CORNELL UNIVERSITY

Score Card for Production of Sanitary Milk

Date..... Dairy of..... P. O.....

		Perfect.	Score.	Remarks.
I. Health of the herd and its protection.	Health and comfort of the cows and their isolation when sick or at calving time.....	45		
	Location, lighting and ventilation of the stable.....	35		
	Food and water.....	20		
	Total.....	100		
II. Cleanliness of the cows and their surroundings.	Cows.....	30		
	Stable.....	20		
	Barnyard and pasture.....	20		
	Stable air (freedom from dust and odors).....	30		
	Total.....	100		
III. Construction and care of the utensils.	Construction of utensils and their cleaning and sterilizing.....	40		
	Water supply for cleaning and location and protection of its source.....	25		
	Care of utensils after cleaning.....	20		
	Use of small-top milking pail.....	15		
	Total.....	100		
IV. Health of employees and manner of milking.	Health of employees.....	45		
	Clean over-all milking suits and milking with clean, dry hands.....	30		
	Quiet milking, attention to cleanliness of the udder and discarding foremilk.....	25		
	Total.....	100		

V. Handling of the milk.			
Prompt and efficient cooling	.....	35	.....
Handling milk in a sanitary room and holding it at a low temperature	.....	35	.....
Protection during transportation to market	.....	30	.....
Total	.....	100	.....
Total of all scores	.....	500	.....

If the total of all scores is		And each division is		The sanitary conditions are	
480 or above	.....	90 or above	.....	Excellent.	.....
450 or above	.....	80 or above	.....	Good.	.....
400 or above	.....	60 or above	.....	Medium	.....
Below 400	.....	Or any division is below 60	.....	Poor.	.....
The sanitary conditions are		Scored by			

A BRIEF DESCRIPTION OF WHAT CONSTITUTES PERFECT UNDER EACH HEADING.

- I. *Health*—No evidence of chronic or infectious disease or of acute disease in any member of the herd on the dairy premises. Freedom from tuberculosis proven by the tuberculin test made within one year.
Comfort—Protection from weather extremes. Stall comfortable—at least 3 feet wide for a small cow, or $3\frac{1}{2}$ for a large cow; length of stall sufficient for cow to rest easily. Sufficient bedding. Frequent outdoor exercise.
Isolation—Removal of cows to comfortable quarters outside of the dairy stable, when sick or at calving time.
Location of Stable—Elevated, with healthful surroundings.
Lighting—As light as a well lighted living room, and with not less than four square feet for light from the east, south or west, for each cow.
Ventilation—An adequate ventilating system of the King or other approved pattern, and, except when the stable is being cleaned, no marked stable odor.
Food—Clean, wholesome feeding stuffs, fed in proper quantities.
Water—Clean, fresh water, free from possibility of contamination by disease germs.
- II. *Cows*—Cleaned by thorough brushing, and where necessary by washing; no dust nor dirt on the hair (stains not considered). The udder thoroughly cleaned by brushing at least thirty minutes before milking, and by washing just before milking, leaving the udder damp to cause dust to adhere.
Stable—Free from accumulation of dust and dirt except fresh manure in the gutter. Apart from horses, pigs, privy, poultry-house, etc.
Barnyard and Pasture—No injurious plants, no mudhole nor pile of manure or any decaying substance where cows have access.
Stable Air—Free from floating dust and odors. Tight partition or floor between the space occupied by cows and that used for storage of feed or other purpose.
- III. *Construction of Utensils*—Nonabsorbent material and every part accessible to the brush, and, except inside of tubes, visible when being cleaned.
Cleaning—Thorough cleaning with brush and hot water, and rinsing. No laundry soap. Thorough sterilization.
Water—From a source known to be pure; protected from contamination from seepage, or surface drainage.
Care of Utensils—Such as to avoid contamination by dust as well as coarser dirt.
Small-top Pail—With opening not over seven inches in diameter, and at least one-third of this opening protected by hood.
- IV. *Employees*—Free from contagious disease and not dwelling in nor frequenting any place where contagious disease exists.
Milking Suits—Freshly laundered and clean; ample to protect from dust and dirt from the milker's person or clothing.
Milker's Hands—Hands and teats dry when milking. Hands thoroughly cleaned before milking each cow.
Milking Quietly—So as to avoid dislodging dirt from cow's hair. At least four streams of foremilk from each teat to be discarded into a separate vessel.
- V. *Cooling*—Cooled within fifteen minutes of milking, to temperature below 45 degrees F.
Handling—In a room used exclusively for handling milk, and free from dust, dirt and odors; and the milk after being cooled, always at a temperature below 45 degrees.
Protection During Transportation—Protected from dirt by tightly closed receptacles, temperature always below 45 degrees F.; not delayed in transit, reaching market within twenty-six hours after milking.

Of course this card would not be usable in the hands of an inspector who knew nothing about it and Professor Pearson prepared a folder for the use of the inspector. On this folder were questions which could be easily answered by any intelligent person. The inspector filled out these blanks at the farm, and in the first case gave the farmer a copy so that he should know just what the inspector was sending in. This was to forestall any misunderstanding and pacify the farmer, for it was painfully evident that the inspector was green at the business.

From these reports the score cards were filled out in duplicate, one being sent to the producer. Each bore a list of the items cut and at the bottom the statement that "errors and omissions would be cheerfully corrected." Thus each producer knew just where he stood and why he was there. Getting at the fact was the first step toward improvement. An item of "Manure on cows, cut 10 points" was perfectly clear and the man knew that if he did not want the cut next time he must remove the manure.

You will observe that the dairies are to be graded into Excellent, Good, Medium and Poor, depending on the score. When we began in September, 1907, there were none excellent, 2 good, 23 medium and 15 poor. I think that this is about as good a showing as could be expected of the average city supply in the State at that time.

Another meeting of the producers was called and the general situation explained to them and their co-operation asked in bettering conditions. They were told that every time that the basis of a cut marked on the score card against their dairy was removed their score would profit by it. The places were pointed out where the greatest gain could be made at the least expense, and they were promised a reasonable time in which to make the improvements before their score should be made known to the public. The time for the annual contracts between the retailers and the producers was drawing near and it was suggested that the scoring and the score card could be used as a basis for making contracts because before the end of the coming year the public would be informed of the score of all of the milk delivered in the city.

The response to this offer was quick and decided. A large number of the producers had evidently wished to make a better article and believing that if the quality of their goods was to be fairly put before the public they would get a price which was right, they

rapidly improved. The contracts between the producers and the retailers were all on the basis of three cents wholesale and the milk was retailed at six cents.

After practically a year in which to adapt themselves to the new condition of things the ratings of all of the producers were given to the public along with the name of the retailer so that the consumer could know the character of the milk he was buying. At the time of first doing this there was some protest from some who had not taken the matter seriously up to this point. They were few in numbers in comparison to those who had worked hard to get their dairies in good condition and have a good rating and after the first time everyone seemed satisfied with the quarterly report of all of the dairies.

The general effect of this system on the milk supply at the end of two years is shown by the report for September, 1909, which shows 3 dairies excellent, 29 good and 3 medium. The poor class has disappeared and the three medium are so near good that the medium class will probably soon disappear. The producers appear to be satisfied, as they are now receiving three and one-half cents wholesale and milk is retailing at seven cents per quart.

The most gratifying part of the situation is the fact that the results have been reached practically without any hard feeling and without any force being exercised. Our milk ordinances only cover a single page of our little book of ordinances and all they say is that milk must not be bottled on the street, milk tickets shall not be used a second time, and all retailers must have a license. We recognize the fact that we have no authority outside of the city limit and that our inspection of the farms is a mutual courtesy. It is the only way we can get the facts and the producers cannot sell their product without it since we grant a license only to retailers of the product of inspected dairies. We have relied on the law of supply and demand to do the work and it has surprised us at the results.

Do not gather from this that the milk problem is solved. Our milk is immeasurably better than it was, but it is still far from ideal food, especially for children. Only three out of thirty-five dairies have been tested for tuberculosis, so that on that point we have made hardly more than a beginning.

The important thing is not the results but the fact that we have found a way of getting results, and when it is found it is simple enough — just treat the dairyman as an honest, intelligent citizen, striving under some difficulties in his effort at improving the quality of his goods, and he will surprise you by the way in which he will live up to the character you have marked out for him.

THE CHAIRMAN — We will hear now from Dr. Louis Van Hoesen, of Hudson, New York.

DR. LOUIS VAN HOESEN — There are to be found in our cities many grades of milk, on account of many grades of milkmen. To say that there is none so bad as to be totally unfit to contribute to a city's source of supply means letting down the bars to some very unscrupulous and unteachable men; and discourages the efforts of the cleaner producer, who should be protected from some of the degraded class of competition.

It is true that we must have different grades of milk; but it is not always true that the common people will select the safe sources of supply, and it will be often impossible to prevent the sale of highly dangerous milk unless by regulations which control to some extent the methods of production.

The vital importance of regulating a milk supply hinges upon the high mortality of infants chiefly among the poorer and more ignorant classes of society. The recent immigrant and his family are not easily led to patronize a safe class of producers; and if as usually happens in our smaller cities, a few of his immigrant acquaintances have embarked in the milk business, we may be certain that the milk produced in the dirty, poorly-equipped dairy of the ignorant immigrant farmer will constitute the source of supply of a majority of these unteachable families. Home care of milk no doubt often adds to the bad effects of a bad supply, and most health officers can testify to the number of burial permit stubs which result.

The law of supply and demand does not often enter into the situation at all among the class of consumers who most need protection from the bad grades of commercial milk, but some minor matter of convenience, reduced price, ability to speak the language of the customer, etc., puts the bad milk in the hands of the ignorant consumer.

Different methods of improving a milk supply seem advisable for different localities; in regions where the influence of agricultural schools has awakened an increasing knowledge of the importance of dairy sanitation, a system of co-operation and encouragement of business pride in reputation of product seems very satisfactory. But not to exclude dangerous milk, and to have no power to exclude the worst grades where known to be highly dangerous to life, leaves a board of health lamentably weak in dealing with this important question.

Inspection of dairies seems indispensable in regulation of a milk supply, and in order to secure the right to inspect dairies located outside the local jurisdiction of a board, it is quite necessary to adopt some system of permits or licenses which entail upon the holder consent to make such inspection. When conditions are found which are so intolerably bad as to make a certain output highly dangerous, and requiring it to be discontinued, considerable power must be given to the local health authorities, or their orders can be successfully defied. I have seen a herd in which a cow with actinomycosis, and pus freely discharging from neck and jaws, was rubbing against other milk cows in a narrow yard and stable, and the owner did not agree with me as to the need of immediate separation of the affected animal. If we cannot control such conditions, our usefulness is too greatly limited.

Whether ordinances or rules should state under what conditions milk should be handled and sold is also in some cases open to discussion; if a number of producers insist that their customers prefer to buy warm milk, and therefore they will not cool the milk at all, but bring it a considerable distance in hot

weather, without reducing its animal heat. Then if practical as well as bacteriological tests show that this milk is being delivered in bad condition, is it not better to have some rule under which the health authorities can compel, if necessary, the proper cooling. In case a producer is found housing 25 cows in a stable which should accommodate 15, and he says he thinks because his grandfather built the stalls for 25 cows, it will have to be good enough for him, and the poles overhead with festoons of cobwebs, dust and hayseed have always been good enough, and he has never taken the trouble to whitewash, and don't intend to do it. Should we not have some rules to fall back upon after the milk of human kindness has soured?

My personal experience with licenses and dairy rules has been rather limited. During the first year of my term of service as health officer (1907) I inspected the dairies supplying the city, and advised certain improvements without arousing any very active interest among the milkmen, only two of thirty complying with my request that at least an annual whitewashing be done. In the fall and winter of 1908-9, the State Department of Agriculture inspected our milk farms, making three tours of inspection at intervals of several weeks, and upon their last visit informed me that two of the dealers supplying Hudson had failed to comply with any of their suggestions, and were producing milk under such highly insanitary conditions that it was advisable to compel them to discontinue their business. How to compel these men to stop selling milk by action of a local health board which had no definite rules, a violation of which could be charged as a complaint in the legal action which was certain to ensue, seemed a puzzle.

A code of milk ordinances was therefore adopted, and while nearly every dairy has greatly improved in some respects, all being now whitewashed, many ceiled overhead, and vast improvement made in the general condition, we were obliged to sue two dealers for the penalty incurred by refusing to apply for licenses. After considerable delay these cases have been decided in favor of the city, judgment being rendered for the amount of penalty, and we hope that these dealers will comply with the regulations, obtain the licenses, and comprehend that a local board of health can make rules in matters which endanger human life, which every man must respect and obey.

As to leaving the regulation of the milk supply to the patronage of the consumer, I would say from my own local experience, that much less than half of the working classes know anything whatever about the cleanliness of the milk they buy, and very many would not listen to, or appreciate, any efforts to inform them, thus giving an abundant market for the dirty and dangerous grades, which often sell for the same price as obtained by the more careful producer.

While ready to hold out the olive branch to the producer of milk who respects the rights and safety of his customers, I believe there are cities in the pioneer stage of dairy regulation, where more will be accomplished if the careless class of producers are impressed with the idea that behind all of our peaceable and harmonious advance, we carry the stimulating influence of the big stick.

As to the effects of dairy regulation upon the financial return to the producer; it has been shown that a reasonable amount of dairy control, by improving the health of cows, increases the production of milk, and the life and health of the cattle, thus benefitting both producer and consumer.

DR. WATERS — We find that in making the inspection that the producers feel we are infringing upon their rights. I cannot take care of that any better than by telling you of a young man who went down the street, swinging his arms in a circle, until finally he struck a man in the face. The man said, "What do you mean by swinging your arms in that way?" The young man replied, "I am exercising my personal rights and privileges." The man who had been struck, said, "Well, your personal rights end where my nose begins." So, I think the personal rights of the producer of milk end when the consumer finds fault and troubles begin.

We find that the trouble with the milk producers is that they are ignorant, indifferent, careless and lazy. Dr. Sadtler scored our milk producers a short

time ago, and after his report was made public one of the milk producers said, that in order to follow out the ideas of Dr. Sadtler, "I would have to charge twelve cents a quart for my milk." I said that if he could furnish twelve-cent milk I would furnish the consumers for it. I think it would be well if a circular was made out, explaining what we would like the farmers to do to improve the condition of their output. The farmers do not understand the score-card, and the State Department of Health, if it placed those in the hands of the health officers, would help us very much to attain the ends to be desired.

THE CHAIRMAN — We will open the discussion, but not for more than five minutes.

DR. ———— I believe the milk is in the condition these gentlemen represent, but I want to call attention to some facts which have come under my own observation with many families, in connection with milk. I have known cases in regard to cholera infantum. The mothers failed to understand what was the trouble. They do not know enough to sterilize the bottle. The bottle is used two or three times without anything being done with it. They do not know enough about rinsing, or putting it in hot water and then putting it in the sunlight, and then cleanse it every time it is used.

DR. ———— I wish to say to this convention, that I am not only the health officer of our town, but I am a producer of milk for the New York market. I acknowledge all that has been said in regard to the standpoint of the sanatorium, and it is good; but I would like the public to understand that we cannot produce such milk as that, such milk as is called for at the very small price we receive for it. We cannot, at the price we receive, give the milk which the theorists lay down for us to-day. Unless the public can be shown that they must pay a reasonable price, they will not get good milk. Professor Harding's address was the only sensible address which I have heard on the matter of production, as he not only tells what the producer should be made to do, but he also speaks of some of the conditions under which the producer labors. I am producing milk now for one and one-half cents a quart, that sells for eight or nine cents a quart in New York. I am paying more for feed to produce that milk by practically double any sum that I have paid in years past. That is, in the last two years the price of feeds has about doubled. That is all the point which I wish to make, and it is a point which must be met if the public is to insist on getting pure milk.

DR. YOUNG — I think we had better look after the feed as well. I have a case of a child nursing from a bottle, and it was not until I took her off the food she was having and put her upon ordinary food that she got well. The stomach had lost the power to establish a proper relation between the component parts. I think when we take the sterilizing milk and putting in benzoate of soda in food, I think some of the living germs in the milk are necessary to promote good digestion.

DR. GOLER — Mr. Chairman, the gentleman that produces one and a half cent milk should get only a cent and a half for it. That is all there is to that. The subject of milk production can be simplified if we could enforce the law. But unfortunately we live in a country where law is made only to soothe. It seems to me there are two standpoints from which we can attack this question, one from the producer and the other from the standpoint of the baby, that is the potential citizen of the State. And it seems to me that the baby has a certain inalienable right to pure milk; and we must see that the child gets what it should have.

The question of milk in cities, whether small or large, when we began our work here forty years ago, it was then a serious problem. To-day it is different. Now what we want in every city is clean, cold milk from tuberculin-tested cows, and I do not believe it is necessary that we, as yet, have to pay ten or twelve cents a quart for milk. It is perfectly possible to show the producer of milk something about what to do with what he has. If we

had in our health organization sufficient men to go out as teachers among the milk producers of the State we would be able to show these men by teaching, very soon, that they could produce milk to be sold in cities like Geneva at eight cents a quart with profit to the milkman and with little additional expenditure of money on the part of the milk producer. That is one of the ways in which the whole milk question is to be decided. To have the man taught what to do with his stable; to urge him to build a higher house; to have him put in a small sterilizing plant, including a boiler, that should cost about \$40, and other small matters that he can put in for \$10, and he should be taught to clean the udder and the cow in a newer way, and get a moderate return for that expenditure. There are men doing that over and over again, and making a good respectable living, and they are selling their own products and getting eight cents a quart for it. That is as far as we can go to-day, but it will deal with the practical solution of the milk question, whether in small cities or in large cities.

THE CHAIRMAN — Our next speaker is Dr. F. Park Lewis, of Buffalo, who as you all know has done more than any other investigator in the United States for the suppression of ophthalmia neonatorum.

DR. F. PARK LEWIS — It is a long step from clean milk and benzoate of soda in food, to prevention of ophthalmia neonatorum. Dr. Goler said in respect to the pure milk supply that the child had a right to proper milk; I think we can add to that that it has a right, an inherent right, to the protection which we will ask for in this connection.

THE PREVENTION OF OPHTHALMIA NEONATORUM

BY F. PARK LEWIS, M.D.

Buffalo

If to any one of us were given the opportunity of conferring upon a human being a gift which would mean a lifetime of happiness and usefulness, and the absence of which would take from that life its brightness and joy — which would give to a fellow creature all of the possibilities, which you or I enjoy — but the deprivation of which would leave only helplessness and dependence — if in a word we could give or take that which would make or mar the entire career of one of our fellows, we would regard such a power as a gift of the gods and be thankful while we lived that we had been chosen to exercise it. Without our fully realizing its import, to each one of us who has the knowledge and the will to act in preventing the blinding of new-born babies is this gift given.

The employment of the right thing, in the right way, at the right time — which is just after the child is born — means seeing eyes. Its neglect may mean lifelong blindness. The failure to use the simple measures that are provided to save the child from blindness is almost always due to the fact that the gravity of the danger is not understood. So many children are born that are *not* infected that the attendant, whether doctor or midwife, grows to feel that much has been made of a little matter, that the infections are relatively rare, and that when they do occur they are easily controlled, and no special effort is made to protect the child's eyes. Then when infection does occur the inflammation which develops is supposed to be a trifling matter, "the baby has probably taken a little cold," then rapidly the inflammation becomes acute and help is wildly sought in every direction. The specialist is called who gives unremitting attention to the suffering child or, as happens among the less careful, the doctor thinks he himself can care for such a controllable infection and when skilled help is finally sought it is found that the damage is irreparable and the baby is hopelessly, incurably blind. That particular physician will probably in future be scrupulously careful in the management of the children whose

birth he attends, but another doctor in the next county or a midwife in the slums of a great city must have a like experience and, while the multitude of children escape, the aggregate of the occasional disaster constitutes a large group who struggle through life with defective eyes or are found in the schools for the blind.

In addressing the health officers of the State of New York, an honor which I assure you I appreciate, I do not hope to be able to present to you anything now touching upon this subject, but as officials of the State your opportunities are so unusual and the possibilities so great for helping in this campaign to save babies from blindness that I hope to emphasize some of the facts connected with this disease, and to ask you, whose experience is so broad and whose knowledge is so wide in matters pertaining to the public health, how a disease so disastrous in its results and yet so absolutely under control may be wiped out as a cause of blindness.

It is not my purpose nor would it be proper at this time and in this place to discuss the medical aspects of ophthalmia neonatorum. I need hardly say to you who are physicians what is common knowledge, that it is an infectious, preventable, and when taken sufficiently early, a curable disease, of new-born infants. When suitable prophylaxis — sanitary and medical — is not employed it becomes one of the most virulent of the inflammation diseases of the eyes. It menaces then not alone the eyes of the infant but the discharge, which is profuse and which is easily carried on the hands of careless or untrained attendants, if introduced into the eyes of an adult produces an inflammation of such a character, if unchecked, as to destroy the sight. It is curable at any time before the cornea is injured, and even then under right treatment the eyes may often be saved. It is sporadic and almost always comes from a previously infected mother. In a relatively small proportion of cases infection may be carried to the eyes of the child from outside sources. It occurs in various proportions in relation to the number of births according to locality in from one in fifty to one in two hundred cases. While it is more prevalent in the crowded districts where the poor live, it not infrequently develops in what is termed the highest social circles. It seldom occurs if one or the other of the parents has not become first infected. It need

rarely result in blindness if the proper preventive and remedial treatment are instituted sufficiently early.

The consensus of opinion is that the most efficient prophylaxis for the destruction of the infectious germs is one of the salts of silver and that which has been chosen for gratuitous distribution in this State, is one per cent. of nitrate. This when used according to specific directions may be employed with absolute safety in every normal new-born child. It produces a slight transitory conjunctival irritation which is termed silver catarrh. It is intended to be used as a prophylactic but once and that immediately after the birth of the child. Should infection develop notwithstanding its use, as sometimes happens, medical treatment should be immediately instituted. An essential is in keeping the eyes constantly cleansed from infecting discharges and the frequent installation of one of the less irritant salts of silver. This is always to be determined on the judgment of the attending physician. When this is done effectively and thoroughly it is the rarest exception that the eyes are lost. The exception does, however, occur and it must be borne in mind that sometimes, notwithstanding the exhibition of the highest skill and the most assiduous care, the disease will pass beyond control, and this very fact again emphasizes the wisdom and necessity of using local prophylaxis in every case.

The question is asked, Are these infections of such frequency and is resultant blindness so common as to warrant the concerted movement that is being carried on in the State and nation for its control? Before I answer this question let me say that not only those who are made blind suffer from this disease. A vastly larger number are those who have had corneal ulcers which have healed leaving scars which have given defective vision, limiting the usefulness of those so affected by numbering them among the partially blind. Of these we have no count. Indeed we have most imperfect records concerning the relative incidence of this disease. We have no records of the cases that occur in private practice. The limited reports from the hospitals are of little value, and no reports are made of the final condition of eyes treated for ophthalmia neonatorum in the various dispensaries.

Cohn, fourteen years ago, stated that in Breslau 2 per cent. of the children born were infected, while Harmon in his excellent

little monograph on "Preventable Blindness"—published two years ago, after many figures which I will not quote, says that they point to the conclusion that in London among every one hundred children born one child suffers from inflammation of the eyes, and of every two thousand children born one is blinded for life. Closely in harmony with these figures were my own imperfect investigations made in the city of Buffalo two years ago. We have reason to believe that the percentage of infection in greater communities is much the same.

Gonorrhœa as estimated by Noggerath is found in 80 per cent. of women as a result of the fact that it is or has been present, in large cities at least, in 90 per cent. of the men. It is not to be wondered, therefore, that the gonococcus causes about 66 per cent. of the infections of the eyes of the new-born. Naturally the largest number of the cases of resultant blindness is aggregated in the schools for the blind. The number of pupils registered at Batavia is about one hundred and fifty, while in the School for the Blind in New York City the registry includes about twice that number. The average number of those in Batavia who have been victims of ophthalmia neonatorum has been about 25 per cent. and as this has been the usual average in all of the schools for the blind in the United States in which careful examinations are made, we may safely assume that in the school in New York City, in which no records are made of this disease as a causative factor of blindness, that the same proportion will be found. These blind, accumulating year after year in the two schools under the State control, in one year, 1907, numbered about one hundred children, and the amount paid for their maintenance by the State was over thirty thousand dollars.

It has been estimated that of the blind in this State over six hundred owe their blindness to birth infections, and \$110,000 is annually paid for their support. It will be evident, therefore, that not only on the grounds of humanity but as an economic proposition, it would pay the State to stop the blinding of its infant citizens.

In order to determine the actual conditions which existed in Boston, the Massachusetts Commission for the Blind secured the appointment of a visiting physician, in connection with the Eye

Infirmary, who went to the homes from which the birth-infected children came. These are some of the facts that were discovered.

The little children, the story of whose blindness is given below, were all born in Massachusetts since 1904. Had their eyes when first they became inflamed been promptly and properly treated, they would be seeing to-day instead of tragically handicapped.

A little four-months old baby whose mother is only nineteen is blind because the doctor did not know the proper treatment for the eyes. The child will always be a charge upon the State. The mother has been deserted by her husband, and her burden is doubled by the fact that she cannot look forward to being supported by her son in after life, as she might if he were a seeing child.

A French-Canadian baby a year old might have been saved from blindness if the doctor's repeated warning that he should be taken to a hospital for continuous care had been obeyed. But the friends were careless or ignorant and when finally they took the child to the hospital when three weeks old, it was too late — a pitiful case, as the young mother must bear the whole of its support.

A little French-American child of nearly two years is starting life wholly blind because of the neglect of the doctor who attended the mother at birth. The home is poor, the mother supporting the family. The baby must be brought up in an institution.

A baby, an only child, with one eye blind and the other badly scarred must be educated as a blind child. The attending doctor thought that the eyes "would get well by themselves."

A child of four years, bright and attractive, with a comfortable, happy home, has been totally blind since the first week of her life. Her mother was very ill at the time of her birth and the baby's eyes were neglected by those in charge. It was found necessary to remove one eye, making her appearance the more pitiful. All her life she will require special training. She might have taken her place among seeing children with a promising future before her, but someone was careless and the loss is irreparable.

An orphan girl, eight years old, is so small and feeble and puny that she looks three years younger. The disease not only destroyed her sight, but it left her eyes in an unsightly condition. She has no relatives and will be a ward of the State.

A child of Austro-Hungarian parents who speak no English was found in her home not far from Boston looking pale and thin, never having been out of doors. It has been found necessary to remove one of her eyes and the other is wholly without sight. She is six years old and will probably be a charge upon the community for life.

An orphan boy living with friends has one eye removed. With the other, though badly scarred, he sees slightly and his friends hoped that he might be educated as a seeing child; now at seven it has become clear that he must be sent to a school for the blind.

A girl of fourteen has lived within a few miles of Boston all her life but cannot read or write because her parents refused to allow her to go to a school for the blind. She is now at least seven years late in beginning her education, while her seven brothers and sisters, who are normal boys and girls, have attended the public schools all their lives.

The persons mentioned below are those who have been blind through a long life.

Fifty years ago a little girl in a comfortable American home was left motherless and blind soon after birth. From the age of six to that of twenty-three the greater part of her life was spent in a school for the blind. She went out well fitted as a music teacher and ambitious to earn her living. As a blind woman, however, homeless, without relatives and not strong, she found herself unable to compete in the struggle for a livelihood and now, at fifty, she is disappointed, lonely and, except for bits of crocheting and knitting, forced into idleness. She has moved from one boarding-place to another, striving to be cheerful, though she has been obliged to live a life of idleness and darkness instead of the life of activity and usefulness she might have had if her eyes had not been neglected at her birth.

A woman of forty-five, totally blind all her life, was educated for seven years at a school for the blind at a probable expense to the State of \$2,000; but though bright, vigorous and cheerful, no work could be obtained for her at which she could earn her living. Private and public charity have helped her by turns, and she has done everything in her power to be useful where she has lived,—sometimes with friends, sometimes in public institutions, but middle age has found her in one of our large almshouses.

The children whose condition is suggested below will always suffer greatly from the effects of ophthalmia neonatorum. They are not technically blind, but are handicapped even to the extent of the loss of one eye. Some are on the border line of blindness and may, after much distressing experimentation and delay, have to be educated among the blind.

A little Irish girl, whose mother of eighteen years has been deserted by the father, has the sight of one eye destroyed. Soon after birth friends, on the advice of the doctor, took her to a hospital but were afraid to leave her there. A week after, when they brought her back, one eye was totally blind.

Another little Irish girl living in a comfortable home escaped

blindness but has a large unsightly scar on one eye because the treatment which the doctor gave her was insufficient.

A Syrian child has both eyes badly scarred, injuring both her sight and her appearance.

The parents of an Italian baby were urged by the doctor who attended its birth to take it at once to the hospital. They delayed until too late and the sight of one eye was destroyed.

Another little Italian baby has his eyes scarred so badly as seriously to interfere with his sight because the midwife did nothing herself for his eyes and did not advise a hospital. (There is no doubt that if careful investigations were made in the State of New York we would find, especially in the congested centers, a like series of cases in which a little care would have saved many babies from such tragic results.)

If it is admitted then, and it cannot be doubted, that blindness is still being produced as a result of birth infections, what must be done to prevent and control the ophthalmia of the new-born?

In our efforts to save the eyes of the children emphasis has not, heretofore, been placed upon the fact that had not the mothers been previously infected the number of cases in which the children would be in danger would be few indeed. Touching on this subject in a recent address on the Blindness of the New Born, Dr. Prince A. Morrow of New York says:

In the praiseworthy crusade against preventable blindness undertaken by the New York Association and other organizations efforts are chiefly directed to the recommendation of the employment of the Crede methods in all cases of child-birth, while the responsibility for blindness is squarely placed upon the shoulders of physicians and midwives for neglect in employing this method. I would not criticize the motives of the public-spirited men and women engaged in this noble work; but I would honestly question the wisdom of a policy which deems it inexpedient to enlighten the public as to a knowledge of the nature of the infection which causes blindness, and the condition under which it occurs, and thus place the responsibility where it belongs. The cause, communicative mode, and consequences of this infection may be traced step by step. In a vast majority of cases it has been contracted by the father of the child in licentious relations either before or after marriage, and communicated to the mother, who is made the passive and unconscious medium of instilling the virulent poison into the eyes of her own child.

In the conception of the laity blindness at birth is generally regarded as an unavoidable misfortune, a visitation of Providence. The public should know that it is the fateful expression of ignorance and criminal carelessness, the working of that relentless law of Nature which visits the sins of the fathers upon the children.

"Let the public be enlightened as to the true facts so that the educational value of the truth may have its full force and effect. In sacrificing truth to expediency do we not sacrifice too much — not only the health and lives of women and children, but the principles of humanity and justice which are outraged by those who carry infection into the family?"

"It is neither good science nor good prophylaxis to ignore the stream of infection continually polluting the channels of maternity, and make no effort to prevent its introduction. The best prophylaxis is to prevent effects by correcting the cause."

If I may, I will again quote the words of that wonderful woman, Helen Keller, who out of her darkness sees so clearly when she says: "The problem of prevention should be dealt with frankly. Physicians should take pains to disseminate knowledge needful for a clear understanding of the causes of blindness. The time for hinting at unpleasant truths is past. Let us insist that the States put into practice every known and approved method of prevention and that physicians and teachers open wide the doors of knowledge for the people to enter in. The facts are not agreeable reading. Often they are revolting. But it is better that our sensibilities should be shocked than that we should be ignorant of facts upon which rest sight, hearing, intelligence, morals, and the life of the children of men. Let us do our best to rend the thick curtain with which society is hiding its eyes from unpleasant but needful truths." And is it not true? When we realize the long list of casualties that come from venereal infections — often ignorantly, frequently innocently acquired, we may rightly ask if we are doing our whole duty in allowing boys to grow into manhood in such dangerous ignorance. The first step then is:

Wider knowledge concerning the cause of birth infection

The public should be taken into our confidence in regard to ophthalmia neonatorum, as it has been in tuberculosis, and it will prove to be an able ally in our struggle to get it under control.

The second step is statistical. In an infectious disease, which is liable to make its victim a public charge, the State has a right to know of its existence when it occurs. It is not necessary that the house be placarded, nor that the records be open to public inspection, but the fact of simply reporting the case, the statement having been previously made, in the birth certificate, that a prophylaxis had or had not been used will emphasize both to the physician and to the family the importance of the condition and will impress upon both the necessity of active and effective measures. It will also enable the department to quickly get in touch with those requiring assistance, and give help when it is needed.

It was found in the city of New York that many children died during the first days or weeks of life from inadequate care before the report of the birth had reached the Health Department.

Last summer a new measure was inaugurated and a visitor was sent at once in the poor districts to see the mother and the child, who were often left without any attention after the departure of the midwife or the tenement-house doctor. Necessary advice was given in regard to the care and feeding of the child and if ophthalmia was present the child was placed under the proper medical treatment. The result was a lowering of both morbidity and infant mortality, and the children were saved in some cases from what would have been inevitable blindness. Having some such course as this in view an enactment was passed in the last session of the Legislature reducing the time in which to report births to thirty-six hours. This was following a plan recently adopted in England, but was not completely carried out.

Unfortunately this early notification was not made to apply to the greater cities of the States, the very centers where it can be most effectively employed. It is sincerely to be hoped that at the coming session of the Legislature this defect may be remedied and the thirty-six hour registration law may be so amended as to apply to the entire State.

The importance of co-operation between the medical men of the State and the Health Department cannot be too strongly urged. The general practising physician is not usually brought in close touch with public movements and does not realize, until shown, how important is his aid in carrying out the plans which are instituted by the Department of Public Health. If at the local medical meetings the papers and discussions could be made to touch upon the larger problems of medicine, none would be more active supporters of these movements for the public good than the physicians of the State.

The solution of this problem of preventing blindness, like that of the prevention of all avoidable diseases, is more widespread knowledge concerning it.

A committee of women of the American Medical Association of which Dr. Rosalie Slaughter Morton of New York is chairman and Dr. M. May Allen of Rochester secretary, has been appointed for the purpose of organizing an educational movement concerning preventable diseases, in the women's clubs of the country. If our Department of Public Health would arrange a popular lecture on ophthalmia neonatorum, with graphic illustrations, such as have been so effectively employed in the tuberculosis campaign, it might be used with telling effect by the various women's clubs and other popular organizations, in making general the knowledge concerning the cause, the danger and the necessity of early and effective treatment in the birth infections of the eyes of the new-born infants.

I cannot too heartily commend the progressive efforts of our State Department which, with Rhode Island, has taken the lead among all of the States in gratuitously distributing a prophylactic to every obstetrician and midwife by placing in their hands a 1 per cent. solution of nitrate of silver. Accompanying the little vial of silver is a circular letter of advice impressing upon the recipient the necessity of its employment. It will serve as a constant reminder and, therefore, as a constant source of education to all having to do with the parturient woman. To briefly recapitulate, then, the ways in which the Department of Public Health can effectively aid in this great movement in preventing the blinding of babies are:

1 *Educational:*

By constituting each of the 1,200 health offices of the State local centers for the dissemination of knowledge both to the medical profession and the lay public concerning birth infections of the eyes of new-born infants.

2 *Statistical:*

Securing data regarding the incidence and results of the disease everywhere in this State; individuals as well as hospitals should make periodical reports. This can easily be done when its importance is recognized.

3 *Legislative:*

a Securing the enactment of an amendment making universal throughout the entire State the application of the thirty-six hour notification.

b Securing the adoption of a uniform law governing the licensing and practice of midwives.

4 *Executive:*

By securing for the infected children immediate treatment as is now done in New York City. This would be possible if births were registered within thirty-six hours, and would so limit the ravages of the disease as to practically wipe out ophthalmia neonatorum, as a cause of blindness in the State of New York.

DR. J. W. KNAPP, Canastota—After the exhaustive paper by Dr. Lewis there seems little for me to say on the subject of ophthalmia neonatorum prevention. It seems to be well established that over 30 per cent. of the cases of blindness in our institutions for the blind are due to ophthalmia neonatorum, and that they would have been prevented had suitable measures been taken for their prevention.

It is not safe for any physician to say that because he has not had cases that he will not. The festive gonococcus is abroad in the land and may turn up where least expected. So when we have a harmless preventative it is our duty to use it. With our present knowledge it is as criminal not to prevent ophthalmia neonatorum as it is not to use anti-toxin in diphtheria.

The general conclusion concurred in by all authorities is that infections can with almost absolute certainty be prevented and in the rare cases in which the infection develops, early treatment almost certainly insures its cure.

THE CHAIRMAN—We will now adjourn sine die.

HEALTH OFFICERS AND DELEGATES IN ATTENDANCE AT CONFERENCE

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F. D. Beagle, Albany.
Joseph D. Craig, Albany.
J. R. Davidson, Bethlehem.
Dr. F. H. Hurst, Guilderland Center.
William S. Magill, Albany.
Dr. Albert Mott, Cohoes.
Dr. M. S. Reid, Coeymans.
A. H. Seymour, Albany.

ALLEGANY COUNTY

Dr. A. T. Bacon, Canaseraga.
J. W. Collier, Wellsville.
W. O. Congdon, Cuba.
H. E. Cooley, Angelica.
W. J. Hardy, Belmont.
Dr. W. H. Loughhead, jr., Andover.
C. W. O'Donnell, Andover.
F. J. Redmond, Fillmore.
George W. Roos, Wellsville.
C. O. Sayres, Belfast.
Edith W. Stewart, Hume.
William S. Todd, Belfast.

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Dr. D. S. Burr, Binghamton.
Dr. E. N. Christopher, Union.
C. H. Hitchcock, Binghamton.
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Dr. W. H. Wilson, Lestershire.

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Dr. E. L. Fish, West Valley.
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Dr. W. F. Gardner, Conewango.
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W. W. Jones, Dayton.
A. D. Lake, Gowanda.
Dr. S. B. McClure, Allegany.
George McIntosh, Cattaraugus.
E. M. Shaffner, Great Valley.
George R. Turk, Little Valley.
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W. D. Cuddeback, Aurora.
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Dr. J. J. Hill, Fair Haven.
Edward A. Hornburg, Cato.
B. K. Hoxie, Sherwood.
Frank Kenyon, Merrifield.
C. L. Lang, Cato.
Dr. R. R. McCully, Union Springs.
F. W. St. John, Weedsport.
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Dr. S. N. Thomas, Moravia.
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Dr. J. H. Kellogg, Bemus Point.
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Dr. O. J. Bowman, Horseheads.
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Dr. M. M. Dolan, S. Glens Falls.
Dr. L. A. Parmenter, Corinth.
Dr. C. S. Preston, Waterford.
Dr. G. P. H. Taylor, Stillwater.
Dr. G. S. Towne, Saratoga.
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Dr. J. M. Tibbits, Fulton.
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Dr. C. W. Carleton, Waterloo.
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Dr. A. J. Frantz, Seneca Falls.
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Dr. H. Halsey, Southampton.
Dr. Frank Overton, Patchogue.
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Dr. G. H. Gurrell, Smithtown.

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Dr. G. S. Carpenter, Waverly.
Dr. C. W. Chidester, Newark Valley.
Dr. M. B. Dean, Candor.

Dr. R. D. Eastman, Berkshire.
Dr. R. H. Fisher, Spencer.

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Dr. Wilbur G. Fish, Ludlowville.
Prof. H. N. Ogden, Ithaca.

ULSTER COUNTY.

Dr. J. M. Bowman, Wallkill.
W. R. Scott, Kingston.

WARREN COUNTY

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Dr. G. A. Chapman, Glens Falls.
Dr. D. S. Hoar, Glens Falls.
Dr. Floyd Palmer, Glens Falls.

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Dr. R. C. Davies, Granville.
Dr. R. A. Heenan, Sandy Hill.
Dr. W. A. Leonard, Cambridge.
Dr. D. C. McKenzie, Granville.
Dr. John Millington, Greenwich.
Dr. J. A. Rich, Greenwich.
Dr. G. M. Stillman, Argyle.
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Dr. J. S. Brandt, Ontario.
Dr. R. S. Carr, Williamson.
Dr. D. D. Cole, Lyons.
Dr. W. J. Hennessy, Palmyra.
Dr. D. F. Johnson, Newark.
Dr. G. A. Jones, Huron.
Dr. R. Morris, Lincoln.
Dr. W. H. Sweeting, Savannah.

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Dr. M. A. Veeder, Lyons.
Dr. F. L. Willson, Sodus.
Dr. G. D. Winchell, Rose.
Dr. A. A. Young, Newark.

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Dr. G. Q. Johnson, Ardsley.
Dr. E. D. Motte Lyon, Peekskill.
Dr. P. H. Mason, Peekskill.
Dr. H. F. Patch, New Castle.
Dr. L. E. Peeler, Harrison.
Dr. Sylvanus Purdy, White Plains.
Dr. E. J. Smith, Larchmont.
Dr. A. E. Strong, Mt. Vernon.
Dr. S. Thompson, New Castle.
Dr. W. H. Todd, Irvington.
Dr. Morris Wolf, Yonkers.

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Dr. E. B. Belknap, Middleburg.
Dr. J. R. Brownell, Perry.
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Dr. W. B. Gifford, Attica.
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Dr. H. S. Halstead, Genesee Falls.
Dr. W. G. Leslie, Java.
Dr. G. S. Skiff, Gainesville.
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Dr. F. M. Chaffee, Middlesex.
Dr. W. H. Hawley, Dundee.
Dr. Schuyler Lott, Bellona.
Dr. C. M. Van Dyke, Himrod.

REGISTERED VISITORS IN ATTENDANCE AT CONFERENCE

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Mr. H. B. Cleveland, Albany.
Mrs. J. R. Davidson, South Bethlehem.
Mrs. Albert Mott, Cohoes.
Dr. C. T. Graham-Rogers, Albany.

ALLEGANY COUNTY

Mrs. W. J. Hardy, Belmont.
Mrs. G. W. Roos, Wellsville.

CATTARAUGUS COUNTY

Mrs. S. B. McClure, Allegany.

CHAUTAUQUA COUNTY.

Mrs. Walter Stuart, Westfield.

CHENANGO COUNTY

Mrs. L. C. Andrews, Pitcher.

DUTCHESS COUNTY

Dr. W. L. Russell, Poughkeepsie.

ERIE COUNTY

Dr. F. Park Lewis, Buffalo.

GENESEE COUNTY

Mrs. E. E. Hummell, Darien Center.
Dr. J. W. LeSeur, Batavia.

HAMILTON COUNTY

Mrs. J. P. Brannen, Long Lake.

LIVINGSTON COUNTY

J. F. Munson, Sonyea.
W. T. Shanahan, M.D., Sonyea.

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Mr. D. H. Atwater, Rochester.
H. E. Bryden, Rochester.
Dr. L. L. Button, Rochester.
Mr. T. A. Caswell, Rochester.
Prof. V. J. Chambers, Rochester.
Dr. O. T. Clark, Rochester.

M. G. Collier, Rochester.
Mrs. J. F. Dale, Rochester.
Mr. G. J. Dexter, Rochester.
Mr. W. H. Dobbin, Fairport.
Mr. E. R. Ganhu, Rochester.
Mrs. C. A. Hauser, Rochester.
Mr. W. S. Hare, Rochester.
Mr. C. W. Herrington, Rochester.
Dr. A. C. Hermance, Rochester.
Mrs. S. G. Hermance, Clarkson.
Dr. E. H. Howard, Rochester.
Mrs. W. J. House, Scottsville.
Dr. Charles T. LaMoure, Rochester.
Mrs. A. Miner, Rochester.
Mr. William Newton, Henrietta.
Mr. R. R. Patterson, Rochester.
Mr. A. S. Pike, Rochester.
Dr. M. C. Potter, Rochester.
Mr. W. S. Price, Rochester.
Dr. J. Sherburne Read, Rochester.
Dr. J. O. Roe, Rochester.
Dr. J. L. Roseboom, Rochester.
Dr. H. E. Sperry, Rochester.

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Mrs. J. S. Walton, Amsterdam.
Miss A. S. Young, Cranesville.

NASSAU COUNTY

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R. S. Morton, M.D., New York.
Dr. A. E. Schmitt, Riverdale.
Miss E. Wettingfeld, New York.
Dr. M. Margaret York, Flushing.

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Mrs. H. E. Richardson, E. Syracuse.
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Dr. C. E. Hallenbeck, Canandaigua.

SENECA COUNTY

Miss C. R. Carleton, Waterloo.

STEUBEN COUNTY

Mr. W. E. Bryan, Corning.

Dr. E. H. Hutton, Corning.

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Jacob G. Schurman, LL.D., Ithaca.

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Dr. M. G. Day, Kingston.

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